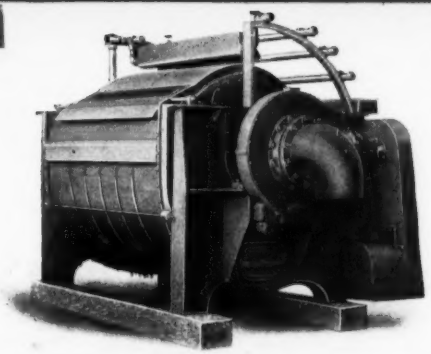
PAPER TRADE JOURNAL

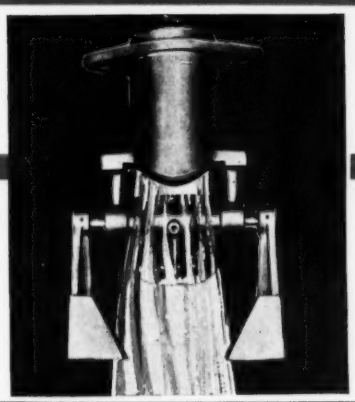
Reg. U. S. Pat. Off.

Vol. CIII SEPTEMBER 3, 1936 No. 10

FAR AHEAD OF ALL OTHERS
AS A DECKER AND WASHER
OF FREE CHEMICAL STOCKS



OLIVER-YOUNG



ABOUT thirty Oliver-Young Filters are now in service deckering or washing pulp. Capacities average much higher than those for any other filter.

As for washing efficiency, a typical case on chlorinated stock tells the story: 99-6/10% of the chlorine is removed consistently by washing on an Oliver-Young. Every unit is doing better than a ton per sq. ft. per 24 hours.

And Oliver-Youngs are still further ahead when deckering or thickening free chemical stock, handling as high as 70 gals. per sq. ft. per min.

All mills handling free stocks will eventually have Oliver-Youngs.

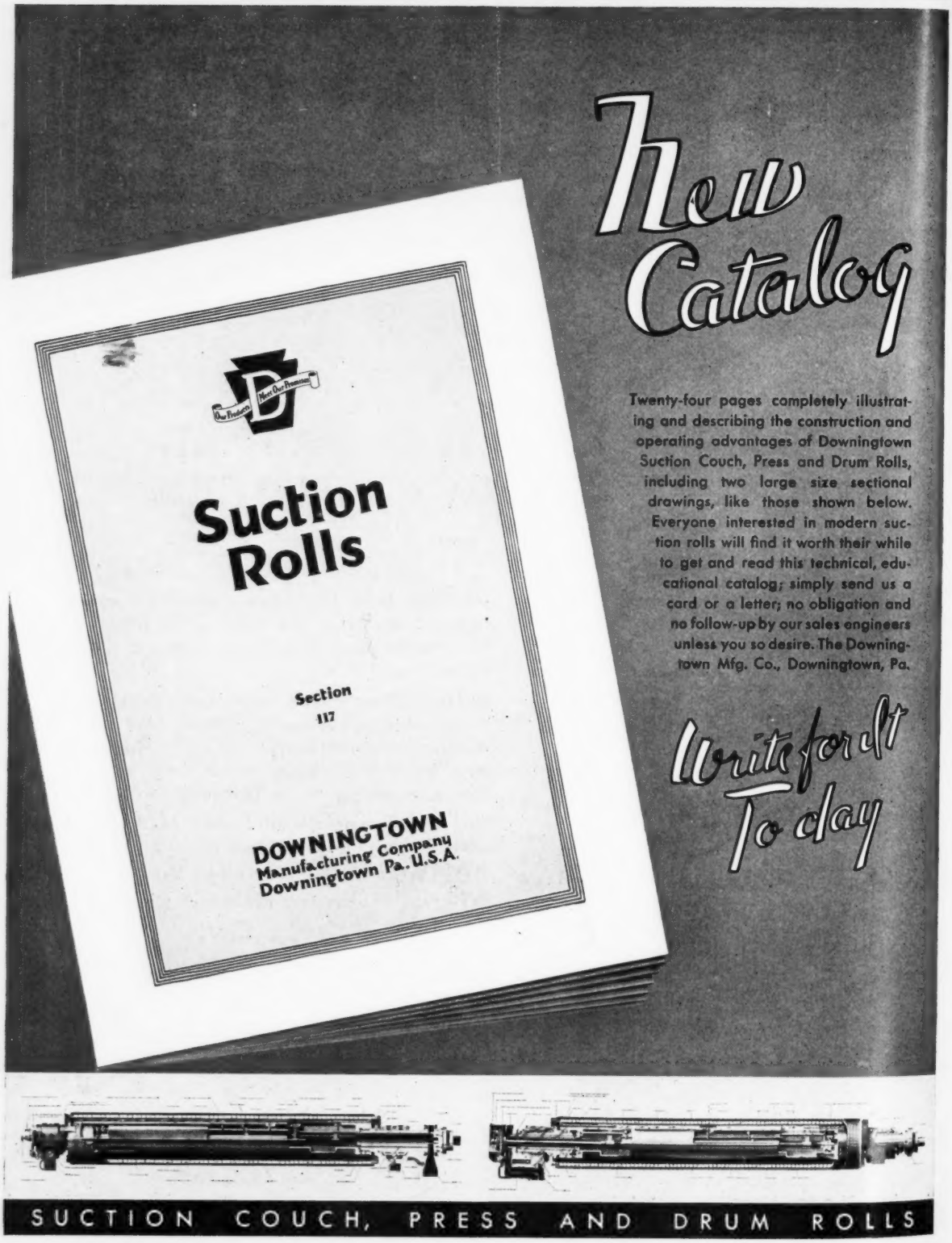
OLIVER UNITED FILTERS INC.

33 West 42nd St., New York, N. Y.

221 N. La Salle St., Chicago, Illinois

351 California St., San Francisco, Calif.

DOWNINGTOWN


Suction
Rolls
Section
117
DOWNINGTOWN
Manufacturing Company
Downingtown Pa. U.S.A.
New Catalog
Twenty-four pages completely illustrating and describing the construction and operating advantages of Downingtown Suction Couch, Press and Drum Rolls, including two large size sectional drawings, like those shown below. Everyone interested in modern suction rolls will find it worth their while to get and read this technical, educational catalog; simply send us a card or a letter; no obligation and no follow-up by our sales engineers unless you so desire. The Downingtown Mfg. Co., Downingtown, Pa.
Write for it To day

SUCTION COUCH, PRESS AND DRUM ROLLS

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PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-FIFTH YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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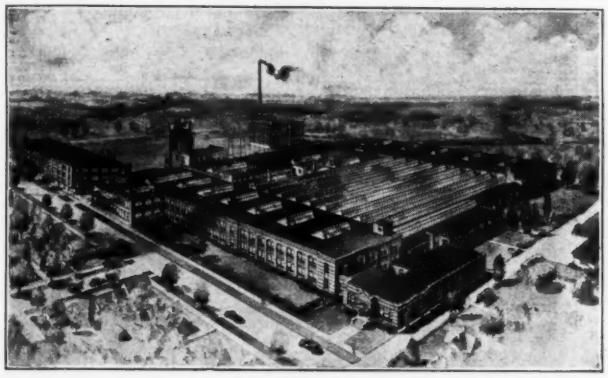


THE HOUSE OF ORR SUGGESTS A TEST

No ordinary line of felts ever built the big modern plant reproduced above.

On the contrary, that plant was built by the Orr line supported by the goodwill of hundreds of paper mills.

Perhaps you are an Orr user. If so, fine and many thanks; if not, you are invited to compare the performance of Orrs with the performance of the make you are using. It is highly probable that you will learn something very much to your advantage.

THE ORR FELT AND BLANKET COMPANY
PIQUA, OHIO

ORR FELTS

The Cause OF AND CURE FOR A CONCAVE CUT

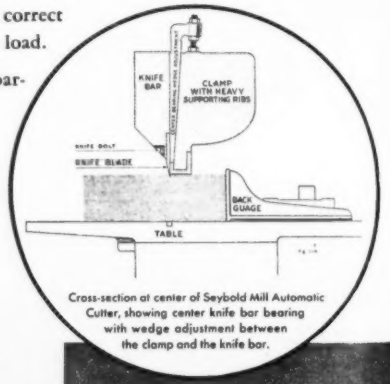
● Do you find in trimming, halving or quartering piles of paper or other stocks that the finished cuts are out of square? The cause is a bow cut.

It is a known fact on Ream Cutters that any knife bar of a span of 56 inches or more, has a tendency to spring if the bar is unsupported. Trimmed with a bow or concave, halving or quartering squarely is impossible.

The Seybold Precision Mill Trimmer is the only cutter fitted with a third or center bearing to the knife bar and equipped with a wedge adjustment to correct this tendency of the knife bar to spring under any condition of cutting load.

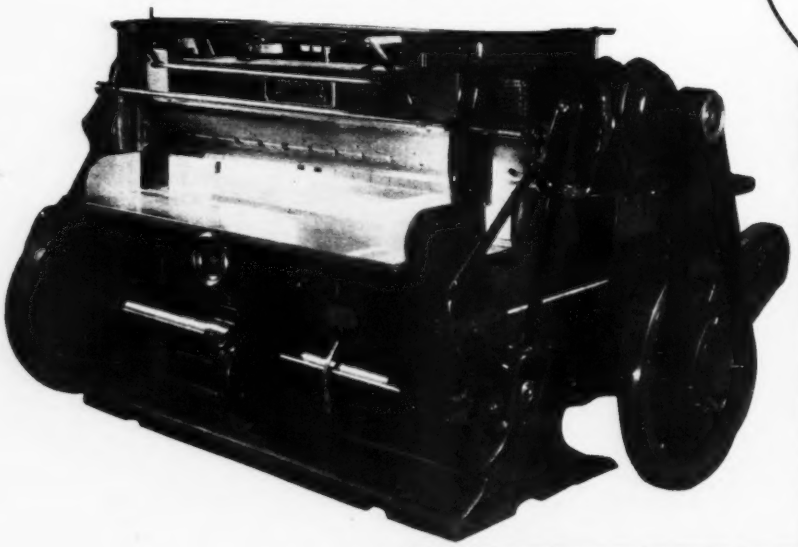
Ask about the new Wide Face Flexible Auxiliary Sole Clamp which is particularly designed for light fluffy papers, especially cockle finished.

Seybold Precision Mill Trimmers are regularly furnished with or without Lay-up Table Equipment.



Cross-section at center of Seybold Mill Automatic Cutter, showing center knife bar bearing with wedge adjustment between the clamp and the knife bar.

HARRIS • SEYBOLD • POTTER COMPANY
SEYBOLD DIVISION • DAYTON, OHIO



Sales Offices and Service Departments Conveniently located as follows:

- New York: E. P. Lawson Co., Inc. 426-438 W. 33rd Street
- Chicago: Chas. N. Stevens Co., Inc. 110-116 W. Harrison Street
- Atlanta: J. H. Schroeter & Bro., Inc.
- San Francisco: Harry W. Brintnall Co.
- Dayton: Seybold Factory
- Toronto: The J. L. Morrison Co.
- London, England: Smyth-Horne, Ltd.

SEYBOLD

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

PAPER — SIXTY-FIFTH YEAR — PAPER

Established Feb. 17, 1899 Consolidated Nov. 16, 1899 with PAPER TRADE JOURNAL.

Vol. CIII, No. 10 Thursday, September 3, 1936

Established Sept. 21, 1910 Consolidated Feb. 19, 1925 with PAPER TRADE JOURNAL.

Hammermill Paper Co. Agents Meet at Erie, Pa.

Paper Merchants Throughout the United States as Well as Export Representatives Hold Three Day Conference — Executives of Company Explain Hammermill Policies to the Agents — the Attendance and Prize Winners.

In 1912 thirteen paper merchants met at Erie, Pa. This year, also in Erie, one hundred and thirty-four merchants and export representatives assembled on August 27 and 28 for the Twenty-fifth Annual Conference with Hammermill Agents.

In those twenty-five years the Hammermill Conferences have built up a sound relationship between Hammermill and its agents and have been the means of a better understanding between merchant and mill. This was brought out in the opening address this year by Ernst R. Behrend, president of the Hammermill Paper Company, who presided at the meetings of the two-day session.

Following Mr. Behrend's opening address, Norman W. Wilson, first vice-president and general manager of Hammermill, spoke of the selling policies back of the well-known Hammermill trademark. H. R. Baldwin, Hammermill's vice-president in charge of sales, explained sales activities planned for the coming year. Mill policies and viewpoints were the subject of a talk by D. S. Leslie, vice-president and assistant general manager.

The story of Hammermill's advertising was dramatically presented by A. Ellis Frampton, advertising manager and assistant general sales manager. J. F. Wuenschel, district sales manager for the Pacific Coast, spoke of the papers made at the Grays Harbor Pulp and Paper Company and G. P. Bothwell demonstrated the new Hammermill line, Dura-Glo Cover.

Visiting speakers included J. H. Brewer, chairman of the merchandising committee of the National Paper Trade Association, and E. V. Johnson, first vice-president of United States Envelope Company.

Meeting at the home of Mr. E. R. Behrend, Wednesday, August 26, the agents' advisory committee conferred with mill officials in forming the program for the meetings. Advisory committee members present were: Chairman W. N. Gillett, Chicago Paper Company, Chicago; C. A. Esty, Carter, Rice & Company Corporation, Boston; I. W. Carpenter, Jr., Carpenter Paper Company, Omaha; P. A. Stuhlreyer, Diem & Wing Paper Company, Cincinnati; H. T. Newell, Jackson Paper Company, Jackson; J. Nacht, Union Card and Paper Company, New York; R. S. Johnston, Old Dominion Paper Company, Norfolk; R. W. Roehm, Beecher, Peck & Lewis, Detroit; V. E. Hecht, Zellerbach Paper Company, San Francisco.

New members of the advisory committee, elected by the agents, were: Max Greenebaum, Beekman Paper and Card Company, Inc., New York; W. N. Schaefer, R. P. Andrews Paper Company, Washington; and H. F. Petrequin, Petrequin Paper Company, Cleveland.

New members of the Advertising Committee are: J. H. Brewer, Storrs & Bement Company, Boston, and F. P. Leslie, The John Leslie Paper Company, Minneapolis.

Both day's sessions were held in the mornings at the Kahkwa Club. Golf and other sports filled the afternoons.

Agent Prize Winners

THURSDAY, AUGUST 27, 1936

GOLF

No. 1 Division—Low Gross, Bert Reeves; First Low Net, Frank Leslie; Second Low Net. I. W. Carpenter.

No. 2 Division—Low Gross, G. Blandy; First Low Net, R. A. Secrest; Second Low Net, Philip Rhodes.

KICKER'S HANDICAP

Winner, Robert Allison

OBSTACLE GOLF

First prize, R. C. Cook; Second price, C. R. Smith.

BOWLING

First prize, J. P. O'Connor; Second prize, E. W. Julian.

THE SELLING GAME

First prize, W. M. Baxter; Second prize, H. F. Petrequin; High Inning, W. N. Schaeffer.

HORSESHOES

First prize, J. M. Knablein; Second prize, R. M. Harris.

Agent Prize Winners

FRIDAY, AUGUST 28, 1936

GOLF

No. 1 Division—Low Gross, A. M. Miller; First Low Net, A. L. Schneider; Second Low Net, Bruce Barton.

No. 2 Division—Low Gross, W. A. Rhodes; First Low Net, J. A. Carpenter; Second Low Net, F. P. Appleton.

HORSESHOES

First prize, S. B. Gaines; Second prize, O. W. McKowen.

OBSTACLE GOLF

First prize, L. R. Reynolds; Second prize, B. R. Moore.

BOWLING

First prize, L. H. Vaughn; Second prize, H. T. Newell.

THE SELLING GAME

First prize, J. J. Dorsey; Second prize, R. M. Clements; High Inning, E. L. Walters.

Hammermill Prize Winners

THURSDAY, AUGUST 27, 1936

GOLF

First Low Net, J. DeVitt; Second Low Net, F. Wuenschel.

Kicker's Handicap—First prize, M. M. Davis; Second prize, Don Leslie.

OBSTACLE GOLF

M. Harrison.

BOWLING

Geo. Carr.

THE SELLING GAME

Frank Knauer.

Hammermill Prize Winners

FRIDAY, AUGUST 28, 1936

GOLF

First Low Net, R. B. Taft; Second Low Net, Stanley Byron.

Kicker's Handicap—First prize, E. Divine; Second prize, H. Peckham.

OBSTACLE GOLF

H. E. Obermanns.

BOWLING

H. A. Obert.

THE SELLING GAME

Geo. Smart.

Those in Attendance.

Herbert S. Kratz and Martin L. Kratz, the Alling & Cory Company, Buffalo, N. Y.; D. S. Landau, the Alling & Cory Company, New York, N. Y.; Alan Chandler and W. J. Shaw, the Alling & Cory Company, Pittsburgh, Pa.; B. E. Reeves and R. M. Harris, the Alling & Cory Company, Rochester, N. Y.; R. P. Andrews and W. N. Schaefer, R. P. Andrews Paper Company, Washington, D. C.; B. R. Moore, Andrews Paper House of York, York, Pa. M. Kiesewetter, Antietam Paper Company, Inc., Hagerstown, Md.; Wiley Baxter, the Baxter Paper Company, Inc., Baltimore, Md.; R. L. Tillman, Beacon Paper Company, St. Louis, Mo.; R. W. Roehm and George A. Naumann, Beecher, Peck & Lewis, Detroit, Mich.; M. Greenebaum, Beekman Paper and Card Company, Inc., New York, N. Y.; J. J. Imholz and L. A. Ramaker, the Bouer Paper Company, Milwaukee, Wis.; Roscoe Taylor, Butler Paper Company, Inc., Fort Wayne, Ind.; S. B. Gaines, the Capital City Paper Company, Springfield, Ill.

C. W. Dau, Carpenter Paper Company of Iowa, Des Moines, Iowa; Virgil Buzard, Carpenter Paper Company of Texas, Fort Worth, Texas; Joseph R. Kirkbride, Carpenter Paper Company, Grand Rapids, Mich.; R. R. Moser, Carpenter Paper Company of Oklahoma, Oklahoma City, Oklahoma; I. W. Carpenter, Jr. and Dewey A. Hoadley, Carpenter Paper Company, Omaha, Nebr.; C. A. Esty, Carter, Rice & Company, Boston, Mass.; J. Harry Custance, the Carter, Rice & Carpenter Paper Company, Denver, Colo.

H. G. Boyer, Caskie Paper Company, Inc., Charlotte, N. C.; A. M. Miller, A. F. Miller and W. F. Boothby, the Central Ohio Paper Company, Columbus, Ohio; W. N. Gillett and Forrest Gillett, Chicago Paper Company, Chicago, Ill.; R. M. Clements, Clements Paper Company, Nashville, Tenn.; E. P. Magel, Crescent Paper Company, Indianapolis, Ind.; F. Dana Payne and John Knablein, the Daka Paper Company, Erie, Pa.; P. A. Stuhlreyer and A. L. Schneider, Diem & Wing Paper Company, Cincinnati, Ohio.

C. M. Yates and Lee H. Vaughn, the Dudley Paper Company, Lansing, Mich.; H. S. Wuenschel and G. J. Kuebel, Durico Paper Company, Erie, Pa.; J. M. H. Fitzgerald, Epes-Fitzgerald Paper Company, Inc., Columbia, S. C.; T. H. Epes, Epes-Fitzgerald Paper Company, Inc., Richmond, Va.; Graham Blandy, 2nd, Charles A. Esty Paper Company, Worcester, Mass.; John J. Dorsey, F. A. Flinn, Inc., New York, N. Y.; A. W. Green, Green and Low Paper Company, Inc., New York, N. Y.

W. J. Kent, R. L. Greene Paper Company, Providence, R. I.; Fred Stutzman and Willard J. Blake, Holland Paper Company, Inc., Buffalo, N. Y.; S. T. Jones, George S.

PICTURE TAKEN AT THE 25TH ANNUAL CONFERENCE OF THE AGENTS AND EXPORT

Clerk and John B. Binley, Hudson Valley Paper Company, Albany, N. Y.; E. A. Damhorst, Irwin Paper Company, Quincy, Ill.; H. T. Newell, Jackson Paper Company, Jackson, Miss.; J. A. Carpenter, Kansas City Paper House, Kansas City, Mo.; Thomas S. Lathrop and P. W. Eason, Lathrop Paper Company, Inc., New York, N. Y.

D. C. Barry, Lathrop Paper Company, Newark, N. J.; S. Walter and Eugene Parks, Lehigh Valley Paper House, Allentown, Pa.; Frank P. Leslie, the John Leslie Paper Company, Minneapolis, Minn.; W. H. Stuart, Henry Lindenmeyr & Sons, New York, N. Y.; James P. O'Connor, Megargee Brothers, Scranton, Pa.; N. K. Woodward, Midwestern Paper Company, Kansas City, Mo.; Robert Schmidt and F. P. Appleton, Miller & Wright Paper Company, New York, N. Y.; Robert S. Johnston, the Old Dominion Paper Company, Norfolk, Va.

A. D. Cleveland, E. C. Palmer & Co., Ltd., New Orleans, La.; Charles M. Bleke, the Papercraft Company, St. Louis, Mo.; Ormond Freile and J. G. Seckel, Paper Merchants, Inc., Philadelphia, Pa.; H. F. Petrequin, the Petrequin Paper Company, Cleveland, Ohio; M. Reinhold, the Reinhold Card and Paper Company, New York, N. Y.; W. A. Rhodes and Philip Rhodes, S. P. Richards Paper Company, Atlanta, Ga.

Ernest C. Mead, Richmond Paper Company, Inc., Richmond, Va.; C. E. Schoff, San Antonio Paper Company, San Antonio, Texas; R. S. Bull and Harry Van Petten, Bradner Smith & Co., Chicago, Ill.; H. Ewing Harris, Southeastern Paper Company, Louisville, Ky.; G. R. Likins, Springfield Paper Company, Springfield, Mo.; W. N. Stetson, Jr. and J. H. Brewer, Storrs & Bement Company, Boston, Mass.; W. C. Strickland, Strickland Paper Company, Inc., Birmingham, Ala.

John D. Swigart, Swigart Paper Company, Chicago, Ill.; A. D. Tayloe, Tayloe Paper Company of Oklahoma, Tulsa, Okla.; J. Nacht, Union Card and Paper Company, New York, N. Y.; C. R. Smith, Van Reed Paper Company, Reading, Pa.; George W. Ward and W. W. McDowell, D. L. Ward Company, Philadelphia, Pa.; Douglas Warner, O. F. H. Warner & Co., Baltimore, Md.; A. A. Sorensen, Western Newspaper Union, Des Moines, Iowa; L. R. Reynolds, Western Newspaper Union, Fargo, N. Dak.; J. R. Hedge, Western Newspaper Union, Lincoln, Neb.

E. W. Buckley, Western Newspaper Union, Little Rock, Ark.; O. W. McKowen, Western Newspaper Union, Oklahoma City, Oklahoma, J. E. Jones, Western Newspaper Union, Salt Lake City, Utah; R. C. Cook, Western Newspaper Union, Sioux City, Iowa; G. G. Gillen, Western Newspaper Union, Wichita, Kansas; E. W. Julian and Robert B. Julian, Western Newspaper Union, Omaha, Neb.; E. L. Walters, Western Paper Company, Omaha, Neb.; Calvin Wilson and Robert D. Wilson, R. D. Wilson Sons & Co., Clarksburg, W. Va.

V. E. Kecht, Zellerbach Paper Company, San Francisco, Cal.; A. W. Akers, Zellerbach Paper Company, Seattle, Wash.; Bruce Barton, C. J. Babcock, and S. A. Harned, Batten, Barton, Durstine & Osborn, New York, N. Y.; W. H. Howe, W. H. Howe, Buffalo, N. Y.; E. L. Wood and P. L. Thayer, P. P. Kellogg & Co., Div., Springfield, Mass.; E. V. Johnson and R. L. Allison, United States Envelope Company, Springfield, Mass.; Russell A. Secrest, Central States Envelope Company, Div., Indianapolis, Ind.; C. T. Roes, National Envelope Company, Div., Waukegan, Ill.

Elwin Walker and J. Borrell, Walker-Goulard-Plehn Company, Inc., New York, N. Y.; C. C. Walden, Jr. and Alfred Walden, Walden Sons & Mott, New York, N. Y.; W. D. Sweeney, H. E. Allen and P. S. Manley, the Dobeckmun Company, Cleveland, Ohio; John R. McDonald, First National Bank, Erie, Pa.; W. F. Zarraga, Riera, Toro & Van Twistern, Havana, Cuba; E. H. Naylor, Writing Paper Manufacturers Association, New York.

Sabin Robbins Jr. Made Chairman

CINCINNATI, Ohio, August 31, 1936—Sabin Robbins Jr. has been elected chairman of the board of the Sabin Robbins Paper Company. Other officers are: H. Junginger Jr., president and treasurer; Sabin Robbins III, secretary; J. F. Seagraves, first vice-president; D. W. Whitelaw, second vice-president, and C. A. Dickerson, third vice-president.

REPRESENTATIVES OF THE HAMMERMILL PAPER CO., ERIE, PA., AUGUST 27-28, 1936

Southern Kraft Corp. to Build Mill in South

New Mill Will Come Into Production in 1937 and Will Increase the Company's Kraft Board Capacity by 120,000 and Its Kraft Paper Capacity by 39,000 Tons a Year—Two Locations in View and Decision Expected Soon

R. J. Cullen, president of International Paper and Power Company, announced last week that one of its principal subsidiaries, Southern Kraft Corporation, will proceed with construction of the new kraft mill in the South, which was mentioned as being under consideration in the prospectus describing the recent issue of $14,500,000 of bonds by that Corporation.

The new mill will come into production during 1937, increasing Southern Kraft Corporation's kraft board capacity by 120,000 tons a year and its kraft paper capacity by 30,000 tons a year.

Plans have already been made for sale of the major portion of this additional production.

Mr. Cullen further stated that two locations have been under consideration and that the final decision as to the location will be made shortly.

Columbia Alkali Enters Liquid Chlorine Field

In line with the progressive policy characteristic of the Columbia Alkali Corporation, and in response to persistent demands on the part of customers and other friends of this well-known, wholly owned subsidiary of Pittsburgh Plate Glass Company, comes the interesting announcement that liquid chlorine and electrolytic caustic soda have been added to the products of this concern. Already, a complete, new plant, modern to the last detail, has been finished and shipments are now being made in single and multiple tank cars, and in 100 and 150 lb. cylinders.

Although the new chlorine plant is located on the company's extensive property holdings at Barberton, Ohio, it is well removed from other plant operations. Every benefit of scientific development; every manufacturing refinement; have been employed in connection with this plant. The latest type of equipment was selected down to the most minute detail. Behind the plant stand years of careful preparation; the enlistment of foremost specialists; extensive research. The greatest care has been taken to protect the operators in the plant and users of the product from hazard. Equally great care has been taken to prevent variation, which has been reduced to a minimum. Columbia's well-known high standards of purity and uniformity as well as service may be counted on by users of Columbia chlorine.

A standard type electrolytic cell is used in the new plant. Raw materials in abundance, together with favorable power situation, and efficient plant operation, coupled with excellent transportation facilities, insure users of Columbia chlorine a most economical and dependable source of supply. The containers—bulk tank cars, multiple unit cars, and cylinders—are of the latest improved design and may be relied upon to render trouble-free service.

The importance of liquid chlorine is increasing rather than diminishing. It is indispensable to a wide variety of industries. Leading uses of liquid chlorine include water purification and sewerage disposal; bleaching of pulp and paper; the finishing processes of many textiles; and as a raw material in the production of many industrial chemicals. Anticipating a steadily mounting demand for Columbia chlorine the officers of the company have made provision for expanding production facilities by units at this modern plant.

For nearly half a century the Columbia Alkali Corporation has been a leading factor in the production of soda ash, caustic soda, and by-products. It is an altogether logical and natural development that chlorine should be added to the line. The executive offices of the Columbia Alkali Corporation, located in the fresh clean air of the 43rd floor of 30 Rockefeller Plaza, (Radio City), New York, reflect in design and equipment the modern spirit of the organization. Branch sales offices are maintained at Chicago, Pittsburgh, Cincinnati, and at the plant in Barberton, Ohio.

For Better Trade Understanding with Germany

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1936—While no responsible government official here will discuss the situation for publication, there is a very general feeling that study is being made both by the United States and German governments toward the working out of some better trade understanding between the two countries.

As the result of the action taken by the German government recently when it discontinued the use of the aski mark and barter for commerce between the two nations, trade between the two countries has fallen off considerably it is reported here. It was a foregone conclusion that it would in view of the fact that all transactions now have to be made on a currency basis.

It was necessary for the German government to take its recent action because use of the aski mark and the barter acted as a bounty paid by the German Government and this meant that the United States had to place certain commodities on a countervailing list which was done. Since the German action this countervailing duty has been withdrawn.

While the rumor cannot be confirmed it is generally believed that the state, treasury and departments of commerce are all working on this problem at the moment.

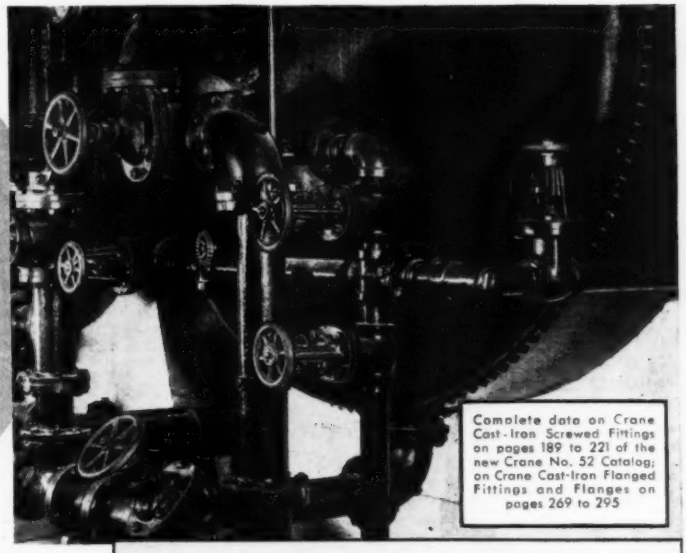
India Changes Classifications for Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1936—The Government of India has received the report of the Tariff Board which has for the past year been investigating the matter of further tariff protection for the local industries, according to a report from Trade Commissioner George C. Howard at Calcutta.

As a result the classification of paper for tariff purposes has been changed in order that certain papers containing more than 70 per cent ground wood may not be imported as printing paper. The local industry, says the report, complained that certain sizes of hard sized paper with a ground wood content was being classed under the lower type of printing paper but was actually being sold as a writing paper in India. The new classification has created separated grouping for writing and printing papers.

Is Your Piping An Asset Or A Liability?


Complete data on Crane Cast-Iron Screwed Fittings on pages 189 to 221 of the new Crane No. 52 Catalog; on Crane Cast-Iron Flanged Fittings and Flanges on pages 269 to 295

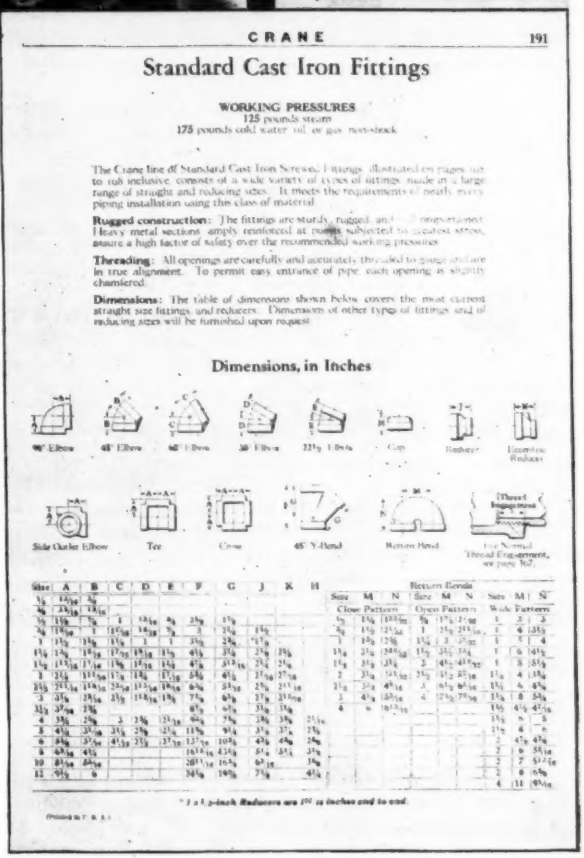
● Paper-mill piping that is leaky and which requires excessive maintenance and repairs is a liability and not an asset. The cumulative cost of such leaks, maintenance and repairs alone can readily exceed in a few months time the purchase price and installation costs of fittings which would have assured maintained tightness and safeguarded production instead of jeopardizing it.

Crane Standard Cast-Iron Screwed and Flanged Fittings are of such good metal and so accurately centered, threaded, flanged, and finished that tight assemblies are made in minimum time and with no undue strains on the piping. The result is joints which remain tight. This is true even after piping assemblies have been rearranged many times using the same fittings.

Crane quality fittings cost no more than ordinary fittings, yet yield handsome dividends in freedom from leakage of valuable fluids and reduced maintenance. Replace those leaky fittings with Crane fittings and save money by doing so.

There's a Crane quality valve or fitting for every pulp and paper-mill requirement. Stocks in every industrial center insure prompt attention to your needs.

Let Profits Pay for Plant Improvements. Use the Crane Finance Plan.



CRANE 191

Standard Cast Iron Fittings

WORKING PRESSURES
125 pounds steam
175 pounds cold water oil or gas non-shock

The Crane line of Standard Cast Iron Screwed Fittings illustrated on pages 191 to 198 inclusive, consists of a wide variety of types of fittings made in a large range of straight and reducing sizes. It meets the requirements of nearly every piping installation using this class of material.

Rugged construction: The fittings are sturdy, rugged, and [illegible] proportioned. Heavy metal sections amply reinforced at points subjected to greatest stress, assure a high factor of safety over the recommended working pressures.

Threading: All openings are carefully and accurately threaded to gauge and are in true alignment. To permit easy entrance of pipe, each opening is slightly chamfered.

Dimensions: The table of dimensions shown below covers the most current straight size fittings and reducers. Dimensions of other types of fittings and of reducing sizes will be furnished upon request.

Dimensions, in Inches

90° Elbow | 45° Elbow | 60° Elbow | 30° Elbow | 22½° Elbow | Cap | Reducer | Eccentric Reducer

Side Outlet Elbow | Tee | Cross | 45° Y-Bend | Return Bend | Thread Impervious (For Normal Thread Engagement, see page 36)

Size	A	B	C	D	E	F	G	J	K	H	Return Bends Size	M Close Pattern	N Close Pattern	M Open Pattern	N Open Pattern	Size	M Wide	N Pattern
⅛	13/16	5/8									⅛	1¼	1 5/16	5/8	17/32	⅛	2	2
¼	1 1/16	13/16									¼	1½	1 21/32	1	25/32	¼	2	2
⅜	1 1/16	⅞	1	13/16	⅜	25/32	1⅞				⅜	1½	1 21/32	1	25/32	⅜	4	3 5/16
½	1 5/16	1	1 1/16	1	½	1	2⅛	1 7/8			½	1½	1 21/32	1¼	1	½	5	4
¾	1 5/16	1 1/16	1 1/16	1	¾	1 1/16	2⅜	1 7/8			¾	1½	1 21/32	1¼	1	¾	5	4
1	1 5/8	1 5/16	1 5/16	1 5/16	1	1 5/16	2⅝	1 7/8			1	1½	1 21/32	1½	1 5/16	1	6	4 5/16
1¼	2	1 5/8	1 5/8	1 5/8	1¼	1 5/8	3	2⅛	2⅛		1¼	2	1 13/16	1½	1 5/16	1¼	6	4 5/16
1½	2 1/16	1 13/16	1 13/16	1 13/16	1½	1 13/16	3 3/16	2⅛	2⅛		1½	2	1 13/16	2	1 5/8	1½	8	5 1/8
2	2 5/16	2 1/16	2 1/16	2 1/16	2	2 1/16	3 7/8	2 5/16	2 5/16		2	2½	2 5/16	2½	2 1/16	2	8	5 1/8
2½	2 11/16	2 5/16	2 5/16	2 5/16	2½	2 5/16	4⅜	2⅝	2⅝		2½	2½	2 5/16	2½	2 1/16	2½	8	5 1/8
3	3 5/16	2 13/16	2 13/16	2 13/16	3	2 13/16	5	3 1/16	3 1/16		3	3½	2 13/16	3	2 5/8	3	8	5 1/8
3½	3 7/8	3⅜			3½	3 5/16	5⅝	3⅜	3⅜		4	4	3 5/16	3½	3 1/16	3½	4½	4 7/16
4	4⅜	3⅞	3	3⅜	4	3 13/16	6⅜	3⅞	3⅞	2 1/16						4	6	5
4½	4 7/8	4 5/16	3½	3⅞	4½	4 5/16	6⅞	4⅜	4⅜	2⅛						4½	6	5
5	5⅜	4¾	4	4⅜	5	4 13/16	7⅜	4⅞	4⅞	2⅝						5	6	5 5/16
6	6⅜	5 5/16	4½	5	6	5 7/16	8⅜	5⅜	5⅜	3⅛						6	6	5 5/16
8	8⅜	6⅞			8	6 15/16	10⅜	6⅞	6⅞	3⅝						8	7	5 5/16
10	10⅜	8⅝			10	8 11/16	12⅜	8⅝	8⅝	4⅛						10	8	6⅝
12	12⅜	9			12	10	14⅜	9⅝	9⅝	4⅝						12	11	6 5/16

* 1 x ¼-inch Reducers are 1¼ inches end to end.

CRANE

CRANE CO., GENERAL OFFICES: 836 SOUTH MICHIGAN AVE., CHICAGO, ILL. • NEW YORK: 23 W. 44TH STREET

Branches and Sales Offices in One Hundred and Sixty Cities

VALVES, FITTINGS, FABRICATED PIPE, PUMPS, HEATING AND PLUMBING MATERIAL

Pulp Mill Waste to be Utilized for Chemicals

Wholly Controlled Subsidiary Formed by Howard Smith Paper Mills, Ltd., to Also Manufacture Chemical Products and Derivatives—New Plant to be Completed Early Next Year Will Have Capacity of 400 Pounds Daily.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 1, 1936—An important departure in the development of by-products of the pulp and paper industry has been announced by the Howard Smith Paper Mills, Ltd. This is the establishment of a wholly-controlled subsidiary, to be known as Howard Smith Chemicals, Ltd., for the manufacture of chemicals, chemical products and chemical derivatives from the waste material of the company's pulp mills.

Vanillin to be Made

The initial product will be known as vanillin, which will be used for flooring purposes.

The capital structure of the chemical company will be $100,000 of 6 per cent cumulative preferred stock and 20,000 shares no par value common stock, presently subscribed.

The company indicates that the capacity of the plant, which will be of brick and steel and will be completed early next year, will be about 400 pounds per 24 hours, of which it is proposed to produce at the present time 100 pounds per day. The plant is being built in such a manner, it is stated, that the capacity can easily be increased as and when demand warrants such an extension.

Not to Affect Cornwall Paper Plant

An executive of the company emphasizes that the plant will have no effect whatever on the output of the company's pulp and paper business in Cornwall, with the new development merely concerned with the utilization of a by-product.

The headquarters of the company are in Montreal, and its plant is at Cornwall, 67 miles south-west of this city. It manufactures a wide variety of commercial papers, the total capacity being 160,000 lbs. per day. It has a sulphite mill with a capacity of 130,000 lbs. of bleached sulphite fiber per day.

Sharp Increase in Newsprint Exports

The value of the newsprint exported from Canada in July was nearly $600,000 larger than in July, 1935, the total being $8,406,237, as compared with $7,446,820 a year ago. The leading purchasers were United States $61,192,086, United Kingdom $452,125, Australia $410,416, Japan $212,837, Argentina $209,499.

Encouraging Reports from Vancouver

From Vancouver comes encouraging reports regarding the export of lumber, with which the pulp and paper industry is closely allied. Lumber exports from British Columbia ports have been running nearly treble what they were at this period last year, and it is predicted that for the year they are likely to exceed 550,000,000 feet to the United Kingdom alone, setting an all-time high.

Work of the Import Committee

A Jacksonville importer of kraft wrapping paper has filed a protest with the United States Customs Court against an advance in value on kraft imported from Sweden, the Jacksonville officials having held that the paper was dutiable at the price actually sold in the Swedish market, and not at the lower price at which the export sale was made. The importers claim that the Swedish price is not a true home market value because the price for Swedish home consumption is arbitrarily fixed by the kraft cartel, the position being that a controlled market price is not a correct dutiable value because of such control. Importers at other ports are now taking the same steps as those taken at Jacksonville.

The United States Court of Customs and Patent Appeals has held that the lower court has the right to fix a dutiable value higher than that originally found by Customs officials. In this case the Customs officials fixed a value about one cent per pound higher than that claimed by the importers. The higher court not only upheld this value, but also the still higher value fixed by the Customs Court after trial of the case.

It is this decision which the importers are trying to overturn. The Import Committee of the American Paper Industry will assist the Government when the case comes to trial in the Fall.

A Detroit dealer is offering a wide variety of colored papers at various Lake ports, at surprisingly low prices, in sheets and rolls. At the prices quoted either the Canadian mill is selling on a basis less than that for standard newsprint, or the importer is seeking to secure sufficient volume of sales to compensate for a low margin of profit. Similar offers of imported paper are current in the Central Ohio territory.

Canary news imported at Philadelphia from Norway is under investigation in the belief that it is undervalued about $3 per ton.

A Los Angeles importer of pink and green paper in poster shades with a high ash content, shipped in 17 inch rolls, has abandoned his protest against the classification of this paper for duty. The paper had been claimed to be duty free Finnish standard newsprint.

The importers of 14 inch rolls of colored paper for the *Pictorial Review* have protested to the United States Customs Court that such paper is duty free as standard newsprint. It was classified for duty. Five separate protests are involved in this case.

One importation of candy roll waxed tissue has been held by Customs officials to be undervalued and one importation was classified for duty at 5 cents per pound and 20 per cent as a manufacture of waxed paper, but is claimed by the importer to be dutiable at 3 cents per pound and 15 per cent as greaseproof paper. Both cases have been appealed to the Customs Courts by the importers.

An importer of English air mail envelopes and letter stock, shipped separately and not as papeterie, claimed that the envelopes and letter stock were both dutiable at the rate of one-quarter cent per pound and 10 per cent as printing paper. The Customs officials, on the basis of letters secured from domestic producers, held the envelopes were dutiable at a much higher rate, plus additions for the decoration, so printed as to render the contents of the envelope illegible. The paper was held dutiable, because of its weight, as tissue paper at 5 cents per pound and 15 per cent.

FIRST IN THE COUNTRY

SCULPTURED IN METAL BY L. L. BALCOM

TO be the first to penetrate the Canadian wilderness in the face of danger and privation took an iron will and dauntless courage. But Samuel de Champlain, doughtiest of the cavaliers, had those qualities in abundance. His the pioneer spirit that achieves against discouraging odds. Centuries later, similar courage and will were displayed by EBG engineers when they were first to produce Liquid Chlorine in America . . . and the first to adapt it to many new industrial uses — in spite of indifference and scepticism. But theirs the pioneering spirit, too. And so an industry was born which now steadily contributes to the wealth of a nation through better manufacturing processes and to the health of a nation through safer and more effectual water purification.

ELECTRO BLEACHING GAS COMPANY, MAIN OFFICE: 9 EAST 41st STREET, NEW YORK, N. Y. • PLANT: NIAGARA FALLS, N. Y.

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Demand for Paper Fairly Satisfactory in Boston

Volume of Fine Paper Sales During July and August Compares Favorably With Preceding Years—Wrapping Paper Division Continues to Display Strength—Tissues Only Moderately Active—Box Board Business Irregular.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 31, 1936—The wholesale paper business continued favorable here during the last week. In some quarters of the fine paper division, a little more activity was reported, although it was stated that competition was very keen, with the cost of doing business increasing all the time. At one house it was said that the volume of fine paper moving during July and August was favorable as a contrast to previous years. The demand for diploma lines was very good.

Favorable reports were also generally made in the wrapping paper division. At a manufacturer's office, it was stated that the demand for tissues was slowing down. In box boards, "business could be a whole lot better, but there is something doing all the time." Twine was reported as in a healthy condition.

The paper stock market was fairly active on the whole, although a certain amount of let-down developed, as is usual a week or two before Labor Day. In old papers, mixed papers were much stronger, although the price remained firm at .35. Old newspapers, with increased demand, advanced to .40 from a previous quotation of .35. The price of print manila, said to be influenced by the value of mixed papers, advanced to .55 @ .60 from .47½ @ .50. Overissue news rose to .50 from .40.

The comment is made that it is amazing that the price of book papers does not advance, considering the strength of pulp. The demand for books and magazines has been very light of late, as the book mills have not been busy.

In bagging, prices held firm, with a few advances. The general tendency in bagging is stronger rather than weaker. Jute rope advanced to 2.12½ @ 2.25 from 1.90 @ 2.10, with a greater demand; Australian wool pouches to 2.35 @ 2.50 from 2.25 @ 2.35; and heavy baling bagging to 1.85 @ 2.20 from 1.75 @ 2.10.

New domestic rags continued steady at the same levels. Prices of old domestic rags remained for the most part the same, although No. 1 roofing stock went up to 1.25 @ 1.50 from 1.30 @ 1.40. There was a little activity in foreign rags, compared with the previous total lack, or nearly total lack of sales.

The market on foreign roofing rags is so high that it is practically impossible for trading here. Prices of dark cottons changed, however, with a range of 1.75 @ 2.00 becoming current, compared with a former quotation of 1.50 @ 1.70. Varying values were named, a range of 1.75 @ 2.00 and 1.70 @ 1.80. Dark cottons have sold in New York at a price of 1.85.

A considerable tonnage of dark cottons used to be exported from Spain, but owing to war conditions, little or none come now, so that the price is high. Old linsey garments advanced to 2.12½ @ 2.37½ from 1.75 @ 2.00.

News of the Industry

The first fall meeting of the New England Paper Merchants Association is to be held September 9 at the Boston Chamber of Commerce.

Charles W. Fields, vice-president of Baird & Bartlett Company, dealers in box boards, is enjoying a vacation, including Bath, N. H.

Henry L. Goodman, dealer in box coverings and fancy papers, has returned from a three weeks trip, accompanied by Mrs. Goodman, passing most of the time at Lancaster, N. H., and the remainder at Moosehead Lake and Manchester, Vt. Golfing and other sports occupied his time.

John Mathers, vice-president of Knight, Allen & Clark, Inc., left Friday for a two weeks vacation, which will include fishing.

William J. McLellan, purchasing agent for Carter Rice & Co., Corp., is spending a two weeks vacation at his summer residence at Pigeon Cove, Rockport, Mass.

John F. Wilson, advertising manager for Carter, Rice & Co. Corp., has gone on a two weeks automobile trip through New Hampshire, accompanied by his wife and family.

Opacity Features in Bond Papers

"We predict," states H. & J. Shapiro Company, Inc., 40 West 25th street, New York City, "that in the very near future, bond papers in all grades, sulphite or rag, will be made regularly with the opacity features that are now being offered generally on special making orders only.

"The Millers Falls Paper Company, Millers Falls, Mass., has just brought out as a standard mill brand line, a new paper, Millers Falls Opaque. This paper has all the characteristics of a fine rag content bond, plus a high degree of opacity. Due to its 25 per cent rag content, Millers Falls Opaque is strong and durable.

"It is available in smooth finish and also in a distinctive Cockle finish that looks well, feels well, and gives a smooth writing surface. And due to its unusual opacity, it can be printed on both sides.

"It is economical and well suited for broadsides, folders, four page letters, house organs, price lists, rate books, sales manuals, letterheads, etc.

"H. & J. Shapiro Company, Inc., carry a complete line of this stock in all standard sizes, Sub. 12, 16, 20, and 24. Envelopes to match can be had too."

Simplified Practice on Box Board Thickness

The Standing Committee in charge of Simplified Practice Recommendation R44, Box Board Thicknesses, has approved a revision of the recommendation, and the Division of Simplified Practice of the National Bureau of Standards has mailed copies to all interests for consideration and approval.

The original recommendation, which established gauge lists or thicknesses of the various kinds of paperboard used in the manufacture of paper boxes, was approved at a general conference of the industry in 1925, and was reaffirmed without change in 1927.

The proposed revision is based on the current standards of the National Paperboard Association, and applies essentially to changes in the thickness of various kinds of box board to meet current needs. Definitions have been added for completeness.

Copies of the proposed revision, in mimeographed form may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Lambertville Paper Mill to Be Reopened Shortly

Workmen Remodeling Tissue Plant, Recently Acquired by Walter Almy, of Philadelphia, Pa., Which Has Not Been Operated for Several Years Past—New Owner of Property Plans to Manufacture Tarnish-Proof Tissue.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., September 1, 1936—All the property and business interests of the William Mann Paper Manufacturing Company on South Main street, Lambertville, N. J., have been acquired by Walter Almy, of Philadelphia, who has started repairs and remodeling and, it is reliably reported, will revive the manufacture of paper there as soon as possible.

Workmen are now busy renewing the roof of the southern portion of the plant, and Mr. Almy has made an inspection, with the assistance of experts, of the boilers and machinery, most of which are found to be in good condition.

Equipped With Three Machines

At one time this was one of the largest producers of paper in this section, making principally tissues. A number of years ago the Mann Company discontinued its operation and since that time several attempts have been made to operate it, the last being in 1929. There are three paper making machines in the plant, which extends for about 175 yards along South Main street, with the Lambertville water power on the west side.

Industrial Asset to City

It is currently understood that the plant will devote itself largely to the manufacture of tarnish-proof tissue. The new owner has been in conference with city officials, and other contacts made here lead local business interests to entertain confidence that the venture will be a decided industrial asset to the city.

The State Highway Department is understood to contemplate the acquisition of a strip about 20 feet wide the full length of this property as an addition right of way on the River Road, but all the buildings set back far enough so that the company will not be inconvenienced at all by this move.

News of the Industry

The past week has been a quiet one in many lines of the paper trade, and the quiet is expected to hold over until after Labor Day, which has come of late to signify the official end of the vacation season.

Whiting-Patterson Company, 320 North 13th street, has just issued a very attractive new catalog and price-list containing 86 pages. Included in this catalog are Excerpts from Trade Customs, Bond Paper, Ledger Paper, Safety Writings, Mimeograph and Wedding, Onion Skins, Coated Book, Uncoated Book, Uncoated Offset, Text and Covers, Cardboard Blanks, Tag and Blotting, Envelope Paper and Tympan, Wrapping and Gummed Paper.

A unique feature of this catalog is that besides an alphabetical index, it contains a Special Index which is so arranged that a heavy black mark is printed on the margin of the first right hand page of each section dealing with a separate classification.

By bending the book backward these marks are exposed opposite the index headings which are printed on this page. If the thumb of the right hand is placed on the mark opposite the section desired the book can be opened directly to the corresponding listing. The catalog is encased in a green thick Marvelleather cover.

Sponsors Dura-Glo Hammermill Cover

The Hammermill Paper Company is sponsoring an entirely new line of cover paper called Dura-Glo Hammermill Cover. The paper is processed by the Dobeckmun Company of Cleveland, Ohio, and is being distributed exclusively through Hammermill agents.

Dura-Glo Hammermill Cover is beautiful, attractive and printable. The brilliant, vivid surface is pleasing to look at and to feel. It combines beauty and durability. It prints well and can be embossed, stamped and die cut. It folds without cracking. Being soil-proof, grease-proof and moisture-proof, dirt or grime that would stain ordinary cover papers can be easily wiped from the processed surface of Dura-Glo Hammermill Cover with a damp cloth.

Dura-Glo Hammermill Cover soil-proof qualities and printability eliminate costly "after-printing" processing. It is designed to provide an attractive, soil-proof, practical printing surface which will enhance color values and prolong the life of: Menus, Reference Catalogs, Price Lists and Books, Parts Books, Covers for Recipe Books and Lubrication Charts.

Crown Willamette's Profits Up

Crown Willamette Paper Company and subsidiaries, including Pacific Mills Ltd., a Canadian subsidiary, report net profit of $635,524 for the three months ended July 31, subject to annual audit and year-end adjustments, after all charges for depreciation, depletion, bond interest and income taxes, and after deducting minority stockholders' interests in the profits of Pacific Mills, Ltd., but before provision for any surtax on undistributed earnings under the revenue act of 1936. This is equivalent to more than $3.17 a share on 200,000 shares of first preferred cumulative stock outstanding and compares with earnings of $497,928, or $2.48 a share, in the corresponding period of last year.

The Chemists' Year Book (1936)

The 18th edition of the Chemists' Year Book is now available. It is a book of 1,237 pages published in England. It is a handy reference volume bound in waterproof fabrikoid imprinted in gold. In its table of contents are the following headings: Physico-Chemical Constants; Analysis; Fuels and Illuminants; Hydrogen-ion Determination; Acid and Alkali Manufacture; Cellulose and Paper; Textile Fibers; Dyes and Intermediates; Patent Law and Chemical Invention; Identification of Dyestuffs, etc. Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry at $6 per copy.

Outlook for Paper Industry Bright In Ontario

Producers Anticipate Improved Showing During Autumn Months Over Corresponding Period Last Year—Major-ity of Paper Manufacturers Reportss Fair Number of Sizable Orders In Sight—Newsprint Continues Very Active.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 1, 1936—Business in the paper industry generally, which has been rather quiet during the past few weeks, shows evidence of improvement and it is expected that a good fall volume will be transacted. A large quantity of stock has just been used in the printing of the fall and winter mail order catalogues of two of Canada's largest stores. These publications are bulkier than last year and have been sent to hundreds of thousands of Canadian homes. A better feeling has been engendered in the paper business, owing to recent heavy rains, the first in many weeks after one of the longest droughts in late years.

The Canadian National Exhibition, which is now in progress and is attended annually by nearly two million visitors, is attracting to the warehouses of the wholesalers a goodly number of out of town buyers and special lines are being presented for their consideration. A number of Toronto paper houses are making attractive exhibits in various buildings at the Canadian National and these are proving to be of much interest and instruction.

While it is rather early as yet to make any definite predictions regarding the volume of turnover for the fall months, wholesalers and producers are looking forward to an improved showing over the corresponding period of last year and most of the mills report that a fair number of sizable orders is in sight.

The newsprint business is very active and last month an all time record production in Canada was made. Recent returns from the Maritime provinces show that paper mills lead all other industries there from the standpoint of value of production.

Pulpwood Operations

There is likely to be an increased cut of pulpwood in Northern Ontario during the coming winter and similar reports are received from other centers. J. A. Coulombe & Co., Ltd., Quebec, report that they have bought over 125,000 acres freehold land, containing over 1,000,000 cords of pulpwood, which will permit them to carry on extensive operations for water and rail shipment. The company will operate on the same scale this season and will be assured of a wood supply for many years. Although the past season started badly and the weather was far from favorable, J. A. Coulombe & Co. have shipped between two and three hundred boats of wood. The company now operate and own twenty boats or schooners and recently bought a big Diesel tug and two barges which they are going to use with their other boats to load steamers and in general pulpwood operation.

News of the Industry

Charles F. Buss, for many years general superintendent of the paper plants of Provincial, Toronto, who resides in Thorold, Ont., and Mrs. Buss recently celebrated their golden wedding and were the recipients of many gifts and hearty congratulations. Mr. Buss is now president of Spun Rock Wools, Ltd., Thorold, but is still retained in a consulting capacity by Provincial Paper. He is a charter member of the Technical Section of the Canadian Pulp and Paper Association and before coming to Canada in 1908 was with several mills in Ohio and Michigan.

The Don Valley Paper Company, Toronto, are busy at the present time and their rebuilt Harper Fourdrinier machine went into commission recently. Among the changes made were ball bearings for breast roll, new shake, ball bearing on table rolls and a new drive for the couch.

Waterous Ltd., Brantford, Ont., who have been established over ninety years, have just acquired the rights for certain paper mill equipment on the patented designs of Bertrams Ltd., Edinburgh, Scotland, and will turn out the new Bertram beater.

John Henry Miller, who was pond foreman of the Thunder Bay Paper Company's mill at Port Arthur, Ont., died recently, aged 58 years. He was a native of Finland and had resided in Port Arthur for 38 years. His wife, two sons and two daughters survive.

Headed by Charles W. Cox, M.L.A., who is Mayor of Port Arthur, Ont., and an extensive dealer in pulpwood, a deputation from the Thunder Bay area of Ontario waited upon the provincial government in Toronto during the past week. The members conferred with the cabinet in regard to a continuation of the present Crown dues on timber and pulpwood. The Thunder Bay men were informed that since the reduction in fees the industry had thrived and it is likely that the cut this winter will be somewhat larger than it was last season.

The Danish steamer, *Norden*, Copenhagen, recently left Campbellton, N. B., with a cargo of pulp for overseas ports. The vessel was consigned to the Restigouche Company and the pulp was shipped from their sulphite mill at Atholville.

Owing to so many fires in timber and pulpwood limits in various parts of Northern Ontario, which are believed to be the work of incendiaries the Ontario government has offered a reward of $1,000 for the arrest and conviction of firebugs. One way of setting a blaze has been the placing of a candle in a tin filled with dry twigs and surrounded by leaves. The candle is left burning and the firebug can get far away in the country before the fire starts.

Complete Flood Prevention Program

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., September 1, 1936—The final work in the program of the Holyoke Water Power Company to guard against damage from further floods was completed last Wednesday. The records show a progressive increase in the height of the floods, whatever may be the cause, since the beginning of the century. The bulwarks of the first dams were built with 10 feet as the estimated highest flood level. The flood of 1912 rose to a height of 12.75 feet over the dam's crest; in 1927 to a height of 14.72 feet and last March to a height of 16.80 feet over the dam. This led to the conclusion that a maximum height of 20 feet may yet be reached; and the walls have been all constructed to a sufficient height so that by use of sandbags this height of water can be forced over the dam, if this emergency arises. Heavy concrete buttresses have been built on the canal side of the head gate house assuring that that structure will stand any flood likely in the next 100 years.

William F. Whiting Dead

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., September 1, 1936—William F. Whiting, of the Whiting Paper Company and Whiting & Co., of this city died early yesterday morning at his home 182 Elm street following a year's illness. He was the son of the late Congressman William Whiting, who founded the Whiting Paper Company; director and large stockholder in many Holyoke industries. He also served for a time as Secretary of Commerce under the late President Calvin Coolidge, who was a frequent visitor to his home.

Mr. Whiting was a man of exceptional versatility and a breeder of note of both Jersey cattle and poultry. In politics he was a staunch Republican and locally was a power for many years in the political field, never however seeking anything for himself.

He married December 19, 1892, Miss Anne Chapin, daughter of Judge and Mrs. E. W. Chapin of Elm street, the Rev. Dr. J. L. R. Trask officiating. He was a member of the William Whiting Lodge of Masons. He leaves besides his wife, three sons, Edward, William and Fairfield and one daughter, Mrs. Ruth Chapin, of Springfield. William is president of the Whiting Paper Company, his father having retired from active management for some time though keeping in touch with the manufacturing interests.

He was a graduate of Amherst College. A few years ago he bought the Lyman Mills property and formed a separate organization, Whiting & Co., which has been operating machines for machine dried papers.

Crown Zellerbach Increases Profit

Crown Zellerbach Corporation and subsidiaries, other than Crown Willamette Paper Company and its subsidiaries, report consolidated net profit of $669,780 for the three months ended July 31, subject to annual audit and year-end adjustments, after giving effect to all charges for depreciation, depletion, debenture interest and income taxes, but before making provision for any surtax on undistributed earnings under the revenue act of 1936. This is equivalent to $2.67 a share on 250,601 shares of preference stocks, Series A and B outstanding, or more than 15 cents a share on the 1,898,397 shares of common stock, after providing in full for dividends of $1.50 a share on the preference stocks for the quarter.

This compares with earnings of $502,019, or $2 a share, earned on the preference stocks, in the corresponding period of 1935.

Ask Receiver for Miami Valley Coated Paper

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, August 31, 1936—James B. Leys, of Detroit, Mich., last Thursday asked for the appointment of a receiver for the Miami Valley Coated Paper Company of Franklin, in a suit filed in the United States court at Cincinnati, over which Judge Robert R. Nevin of this city presides. A branch of the court also is located at Dayton.

Leys contended that the company had defaulted since May 1, 1932, in payment of interest on $70,000 worth of first mortgage serial 6 per cent bonds executing two deeds of trust in order to protect bondholders.

Leys asked an injunction to restrain the company from transferring any of the property covered by the mortgages, and that the Ohio Citizens Trust Company of Toledo, Ohio, as Trustee, be ordered to file a cross-petition asking for a foreclosure of the mortgages.

Division of Cellulose Chemistry to Meet

An interesting program has been arranged for the annual meeting of the Division of Cellulose Chemistry of the American Chemical Society at Pittsburgh, Pa., September 7 to 11 inclusive. The following papers will be presented Monday afternoon, September 7:

"A Study of Cellulose Hydrolysis by Means of Ethyl Mercaptan," by M. L. Wolfrom and L. W. Georges.

"Difference in Swelling Between Technical Cellulose Derivatives of High and Low Viscosity," by J. R. Katz.

"X-Ray Studies of the Action of Organic Amines on Cellulose," by A. J. Barry, A. J. King and F. C. Peterson.

"The Pentosan Content and Structure of the Middle Lamella," by A. J. Bailey.

"Pectic Acid from the Cotton Fiber," by S. A. Harris and H. Jeanne Thompson.

"The Effect of Certain Non-Cellulosic Constituents on the X-Ray Diagram of Cellulose," by W. A. Sisson.

"Disintegration of Cellulose Membranes," by Wanda K. Farr.

"The Viscosities of Cuprammonium Cellulose Sols," by W. D. Bancroft and J. W. Ramsay.

The following papers will be presented Tuesday morning and afternoon:

"Furfural as an Outlet for Cellulosic Waste Materials," by F. N. Peters, Jr.

"A Comparative Study of Some Methods for the Quantitative Determination of Furfural," by H. P. Howells.

"Fractionation of Methanol Lignin," by E. E. Harris.

"Nitration of Lignin," by E. E. Harris and E. C. Sherrard.

"Effect of Cook and Lignin Content of Pulp on Its Fermentability by Thermophilic Bacteria," by F. R. Olson, W. H. Peterson and E. C. Sherrard.

"Chemical and Physical Deterioration in Relation to the Quality of Raw Cotton," by C. N. Conrad.

"Comparison of Soda and Nitric Acid Pulps Made from the Whole Cotton Plant," by A. R. Macormac and F. K. Cameron.

"Oxidation of Starch," by G. E. Felton and R. M. Hixon.

"Sorption of Water Vapor by Papermaking Materials. III. Hysteresis," by C. O. Seborg.

"Pulping Wood with Alcohols," by S. I. Aronovsky and R. A. Gortner.

"Proximate Analysis of the Heartwood and Sapwood of Some American Hardwoods," by R. D. Freeman and F. C. Peterson.

"The Viscosity Characteristics of Cellulose and Hydroxy Ethyl Cellulose Nitrates," by A. W. Schorger and J. H. Ver Hulst.

"The Mechanism of Cellulose Benxylation," by E. J. Lorand and E. A. Georgi.

"Action of Light on Cellulose. I. Viscosity Concentration Relationships of Cellulose Acetate Solutions," by R. E. Montanna and C. C. Winding.

"Action of Light on Cellulose. III. Effect on the Copper Number of Cellulose Actate," by C. C. Winding and R. E. Montanna.

TAPPI Meeting at Syracuse

The New York members and friends of the Technical Association of the Pulp and Paper Industry will meet at the Hotel Syracuse, Syracuse, N. Y. on Saturday, September 26, 1936. There will be a luncheon at 1:00 P. M. followed by a golf tournament at Drumlin's Country Club.

At 7:30 P. M. there will be a dinner at which time John P. Hagenauer of the American Paper and Pulp Association will discuss "Paper Machine Operating Efficiencies." Anyone wishing to attend will be welcome.

The only maintenance MORSE CHAINS need comes in a drum!

Routine Oiling Keeps Morse Drives Operating Efficient ly Year In and Year Out
Morse Positive Chain Drives speed on—day after day and year after year—calling for no maintenance other than a frugal diet of oil. Morse Roller Chains are protected and safely enclosed in an oil-tight case.
Tests prove Morse Positive Drives are 98.6% efficient. They cannot slip and waste power. They do not break down and hold up production.
Morse Silent Chains have transmitted power for 20, 25 and even 30 years—without major repairs or replacement. The first cost of a Morse Silent Chain Drive is no more than for an old-fashioned type drive, and the most important cost—the total cost per year of efficient service—is materially less.
Phone your local Morse engineer or write to our engineers here in Ithaca for more complete information on how Morse Chains can help keep your production costs down and your production schedules up.

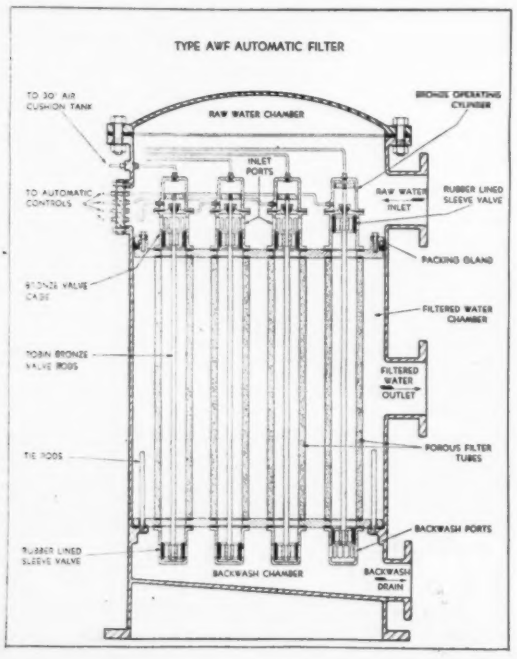
MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y. DIVISION BORG-WARNER CORP.

Type AWF Adams Automatic Filters

The purpose of the automatic filter is that of producing a continuous flow of filtered water of such clarity as to meet each particular condition of service. The filter tubes may be supplied in various porosities, allowing for a degree of filtration from crystal-clear water to .0039 inch diameter solids. In the event that crystal-clear water is required coagulation must take place before filtering, the treatment depending upon the nature of the solids involved. Coagulation with aluminum sulphate for a period of 10 to 15 minutes is very effective in precipitating the soluble coloring matter, rendering it in such form as to be subject to separation in the filter tubes.

The Adams automatic type AWF filter produces a continuous flow of filtered water and automatically eliminates the impurities as they are collected. The flow cycle is as follows: The water enters through the raw water inlet into the top chamber, and thence through the inlet ports on the top valve cages. The water then travels downward through the sleeve valves into the interior of the filter tubes where it filters through the walls of the tube into the filtered water chamber. The impurities are collected on the interior walls of the filter tubes, where they are retained until back washing. Every three minutes or longer, depending upon the back wash cycle, water under 100 lbs. pressure is admitted through the copper tube to the under side of the piston in the control cylinder. This action causes the piston to move to its upper limit carrying the two rubber lined sleeve valves with it, closing off the inlet ports in the top valve cage and uncovering the back wash ports in the lower valve cage. This action releases the pressure within the tube and automatically closes off the flow of raw water. Inasmuch as filtered water pressure exists in the exterior surface of the tube and atmospheric pressure within the tube, the flow of water is back in the reverse direction, washing off all the impurities and carrying them down and out the back wash ports into the lower back wash chamber. At the end of ten seconds the automatic control mechanism releases the water pressure from the lower side of the piston and, due to the 30 lbs. air pressure always existing on the top side, causes the two sleeve valves to move back into filtering position, closing off the back wash ports and opening up the raw water inlet ports for the resumption of service.



The smallest size filter built in this type involves five filter tubes so that when one tube is in back wash position the water necessary for back washing is supplied by the other four filter tubes. The units are conservatively rated so as to produce the rate of continuous flow without interruption from the back wash requirements. The only moving parts are the two rubber lined sleeve valves attached to the Tobin bronze piston rod. These have a travel of but 2 inches every three minutes and being rubber lined operating in cast bronze valve cages represents an extreme minimum in wear.

The Adams type AWF automatic filter has been designed in such a manner as to provide maximum in accessibility for inspection. The interior diameter of the tube is ¼ inch larger than the diameter of the sleeve valves, so that the complete valve assembly may be withdrawn from the top without interfering with any of the other filtering elements. The whole assembly is removable from the shell without disturbing any of the piping connections. It is merely necessary to remove the cover, the packing ring, and the through holding bolts in order to lift the complete assembly from the shell. This is a distinct advantage where inspection of the filtering element is scheduled for once every year. There is very little danger of tube breakage inasmuch as the material from which these filtering elements are made represents grinding wheel strength. All the tubes are in compression at all times, eliminating any tendency for bursting strain to exist.

The interior working parts of the filter, together with the shell, may be fabricated from corrosion-resisting material, making them 100 per cent suitable for process work where the ordinary brass and steel are not suitable. The filter tubes are inert to the action of acids and do not deteriorate. The filtering material has been in service for over ten years with complete success, assuring prospective purchasers that the filtering element does not eventually clog up with impurities. When installed and operated in accordance with instructions, the filter will continue to produce filtered water continuously with automatic solid elimination, representing a distinct advancement in the field of filtration.

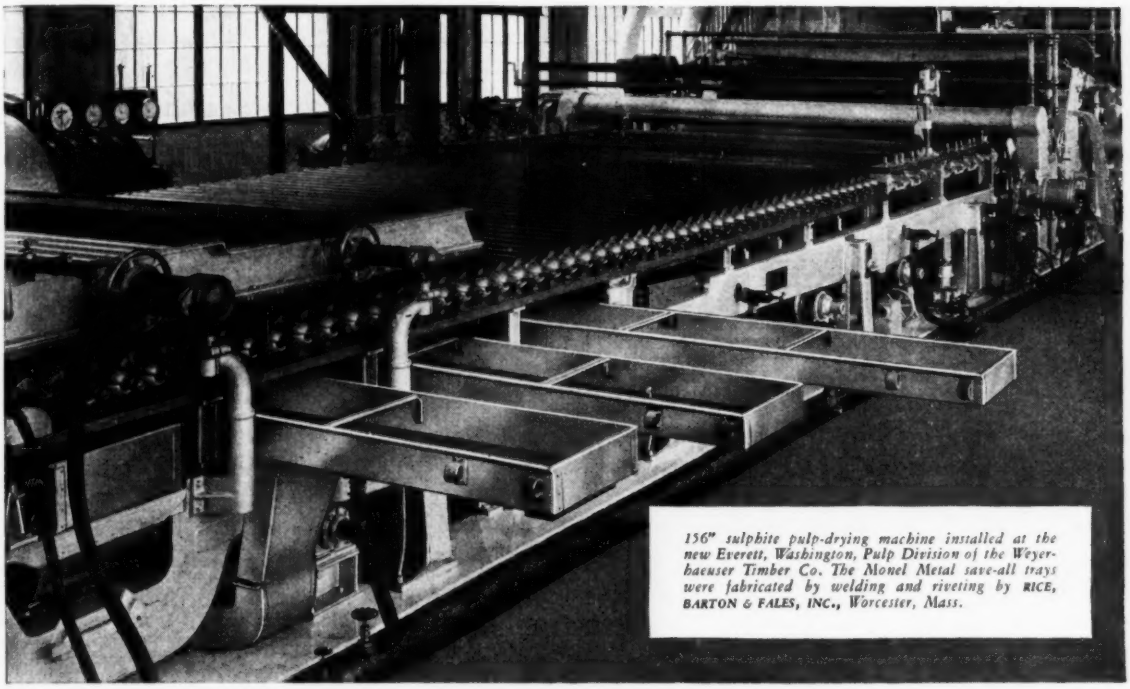
Common Sense Ventilation

The Swartwout Company, 18511 Euclid avenue, Cleveland, Ohio, has just issued an interesting bulletin on ventilation. In the foreword it is stated that: "Volumes have been written on 'Ventilation,' covering the subject from almost every conceivable viewpoint. Some treat it as a hard and fast mechanical proposition that can be governed to an exact degree—others go to the opposite extreme making it, to a more or less degree, a matter of guesswork. Both are in error and misleading.

Real ventilation presents some problems that can only be solved by hard and fast mechanical rules and mathematical calculation. It also presents some problems that can only be solved by the intelligent exercise of mature judgment tempered by actual experience. Both necessarily enter into the picture of any ventilation requirement. Therefore the common sense recognition of both makes for "common sense" ventilation.

The purpose of this Bulletin is to look at Industrial and Commercial Building Ventilation from the "common sense" standpoint which anyone can understand in order to arrive at the most logical, the most economical, and the most satisfactory solution to any ventilation problem." Interested firms or individuals should ask for Bulletin V-100-B.

Weyerhaeuser Selects Monel Metal for SAVE-ALL TRAYS



156" sulphite pulp-drying machine installed at the new Everett, Washington, Pulp Division of the Weyerhaeuser Timber Co. The Monel Metal save-all trays were fabricated by welding and riveting by RICE, BARTON & FALES, INC., *Worcester, Mass.*

Monel Metal was chosen because it combines strength, rigidity, and corrosion resistance

HERE'S a sulphite pulp dryer, designed to turn out 150 tons a day, for the newest pulp mill on the West Coast.

Weyerhaeuser had this dryer specially built . . . and used the most expert engineering advice to get the best metals for each part. And WHY do you find Monel Metal in the save-all trays?

Because any trays as long as these must have great strength and stiffness. *And Monel Metal is stronger than structural steel.*

Because to *keep* their strength, trays must resist the corrosion of white water from unbleached sulphite pulp. *Monel Metal's resistance to such conditions has been proved by years of service.*

Because the best way to make these trays serviceable is to fabricate them by welding and riveting. *And because welds of Monel Metal have the same resistance to corrosion as the base metal. And that without needing any heat treatment.*

Incidentally, because Monel Metal's solid, non-rusting surface stays SMOOTH. This means less accumulation of stock, slime, filler. You count the difference in hours saved at clean-up time.

Smart paper men find every week new places to take advantage of these virtues of Monel Metal. Look at the list appended where Monel Metal is now in common use. Write Inco's engineers; you'll find their experience of value when you plan replacements.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.

SOME OTHER USES OF MONEL METAL IN THE PAPER MILL

- Black Liquor and Caustic Soda Evaporator Tubes
- Beater Bars
- Jordan Engine Fillings
- Cylinder and Drum Winding Backing Wire Cloth and Facing Cloth
- Cylinder Mold Stay Rods ($\frac{5}{16}$")
- Couch Roll Stay Rods
- Suction Box Stay Rods
- Suction Boxes and Tops
- Suction Box Trays
- Table Rolls
- Doctor Blades
- Pump Rods and Shafts
- Valves and Fittings
- Alum and Size Systems
- Coating and Coloring Preparation

MONEL METAL

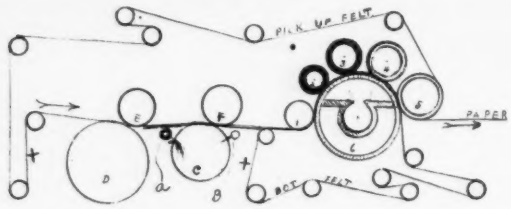
Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL METAL

Gets Patent on Board Machine Suction Press

Daniel Bert, of Monroe, Mich., was recently granted a patent on a board machine suction press and has made application for a patent on a board machine water extractor.

The extractor drier aims to provide a novel means for blowing the extractor roll dry, by fluid pressure such as air or steam, just before one part of the extractor roll reaches the nip on the paper between the extractor roll and the couch roll that cooperates with the extractor roll. In practical operation water necessarily is discharged upon the extractor roll by water shower B. Notwithstanding the fact that the body of the extractor roll C is made of fine wire, there is a tendency for the water to collect in



the angles that exist between the ribs and the body of the extractor roll, the water being carried upwardly upon the paper.

A shows a new device consisting of a pipe being disposed parallel to the extractor close to the wire. The pipe has a longitudinally extended discharge means, preferably a slot ordinarily not to use over 15 h.p. per 100 inch, although that detail may be adjusted as the circumstances of the installation require. Any suitable discharge means may be substituted in the place of the slot. The blower is so positioned that it discharges through the wire of the extractor roll and rids the wire of water before the paper passes through the nip.

As a consequence of the operation of the machine, the formation of a film of water on the outer surface of the sheet of paper is avoided. The blast will keep the extractor clean. Owing to the fact that the extractor wire is kept clean and dry, the efficiency of the extractor will be increased fifty per cent as a means for extracting water from paper. The operation of the device will stop felt troubles such as picking, blowing and crushing and produce a better printing surface on all board. The device will enable all mills manufacturing .009 straw to use the extractor roll to good advantage.

The board machine suction press proposes divers improvements in a paper making machine, one object of the invention being to provide an arrangement of pressure rolls located about a suction drum in such a compact fashion that the felts may be made much shorter than heretofore and several belts and drives made unnecessary.

A further object of the invention is to provide novel means whereby the pressure rolls exert a progressively increasingly pressure in the direction of the drum and act with progressively decreasing resiliency upon the drum. The rolls are mounted in an arch designed frame and are adjustable to any position. No. 1 roll brings both felts together with the paper in the center and makes contact with the suction drum. The rubber coverings will play an important part in the operation of this press. No. 2 roll to be of very soft rubber; No. 3 and No. 4 to increase in resiliency and No. 5 to be the ordinary press roll about 22 inches in diameter.

The sheet of paper between the two felts is wet and very tender and needs a gradual pressing. The very soft rubber rolls at the nip will give a broad pressing surface and blot out much water, the entire surface under the pressure rolls will be exposed to the vacuum of the drum roll.

This press is designed to do the work of four suction presses and four suction boxes. There will be no water left in the paper when it comes out of this press. The sheet will be perfect, unstretched and will maintain its strength.

Imperial Paper Makes Good Report

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., August 31, 1936—The annual meeting of stockholders of the Imperial Paper and Color Corporation was held last week at which officers and directors for the year were chosen. The annual report showed that combined sales of the company totaled $6,376,250.33 for the fiscal year ending June 30 against $5,592,377.86 for the year ending June 30 of last year. Substantial increases in the sales of both the pigment color and wall paper divisions of the company are reflected in the statement. Current liabilities show a ratio of 12.3 to 1. Net profits for the year amounted to $416,790.53 against $353,,910.15 for the year preceding. A $3 per share dividend was also declared by directors. The company is installing a modern power plant that not only will give a high efficiency in the production of high pressure steam so necessary to production of both pigment colors and washable wall paper but will also eliminate the clouds of smoke characteristic of the less modern power plants. The company employs about 1,200 people and the annual payroll has increased to over $1,700,000, a figure now comparable to 1929. About 800 are employed in the local plant.

R. E. Hall Made Doctor of Science

The honorary degree of Doctor of Science has been conferred by Ohio Wesleyan upon Dr. Ralph Emmons Hall, head of Hall Laboratories, Inc., of Pittsburgh.

The presentation, made by the University at which Dr. Hall engaged years ago in undergraduate work, was conferred by the board of trustees as a recognition of outstanding accomplishment in the field of boiler water chemistry.

Dr. Hall led the research which resulted in liberating industry's steam power plants from scale and corrosion. In 1933 he was given the award of the Pittsburgh section of the American Chemical Society for outstanding achievements in water chemistry.

The chemical engineers of Hall Laboratories today service more than a thousand industrial plants in their water problems connected with steam power plants, while the home organization is engaged in further research into the causes of embrittlement, and is studying new ways of removing oxygen from the boilers.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1936—The Government Printing Office has received the following bids for 48,000 sheets of 20 x 24 buff gummed paper; Whitaker Paper Company, at $9.10 per M sheets less 2 per cent; Royal Card and Paper Company, $9.00; R. P. Andrews Paper Company, $9.13; Mathers-Lamm Paper Company, $8.99; Walker-Goulard-Plehn Company, Inc., $9.49; Reese & Reese, Inc., $9.30; and Virginia Paper Company, $9.00.

With today's increased loads on power plants, such as shown here, engineers are checking their equipment carefully to assure maximum efficiency. Turbine lubricants of highest uniform quality are needed to insure continuous, trouble-free operation.

GULFCREST

The ONLY ALCHLOR PROCESSED TURBINE OIL

Gulf Offers Power Plant Operators the Most Stable Turbine Lubricant Obtainable

"GULFCREST is the finest turbine oil we know how to make"—that is the statement of Gulf's large staff of technicians and refinery experts.

For Gulfcrest is the only turbine lubricant treated by the ALCHLOR Process. This famous process—exclusively Gulf's—permits the manufacture of a more stable turbine oil than is possible by any other process yet developed.

That is why Gulfcrest Oil has the highest resistance to oxidation and to the formation of acidity and sludge. The performance records of this oil in turbine systems of leading power plants are unparalleled. It is the safest and most economical turbine lubricant you can buy.

4 REASONS why Gulfcrest Oil is the Turbine Lubricant of Unparalleled Quality

1 *Refined by the ALCHLOR Process.* This famous process, patented and owned exclusively by Gulf, is the most thorough and effective method for removing chemically active hydrocarbons as well as the general run of impurities present in all crudes.

2 *Highest resistance to oxidation.* Because this famous ALCHLOR Process synthesizes and rearranges the molecular structure of certain hydrocarbons, resulting in a finished product of greater stability, GULFCREST OIL stands alone in its high resistance to oxidation.

3 *Highest resistance to acidity and sludge.* Because of the elimination of oxidation catalysts in addition to the unparalleled refining power of the Alchlor Process, these oils form less gum and deposits, less emulsion and sludge, when mixed with water over a period of several years continuous operation, than any other turbine oil of which we have record.

4 *Highest kilowatt-hour performance.* Because Alchlor not only makes possible an oil more thoroughly refined and homogeneous but also creates antioxidants, these oils have great resistance to deteriorating influences and are longer lived. Less makeup oil is required.

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation ★ Gulf Refining Company

General Offices: Gulf Building, Pittsburgh, Pa.

GULF OIL CORPORATION—GULF REFINING COMPANY P.T.J.
3800 Gulf Building, Pittsburgh, Pa.

Please give me complete information regarding Gulfcrest Oil.

Name.....

Title.....

Company.....

Address.....

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Tonawanda, N. Y.—Tonawanda Boxboards, Inc., Clay and Tonawanda streets, manufacturer of box boards, test liners and other paper board products, has approved plans for new one-story addition to plant, for which superstructure will be placed under way at once. General contract has been awarded to the Lakeland Engineering and Construction Company, Electric Building, Buffalo, N. Y. Cost close to $50,000, including equipment. Company is a subsidiary of Robert Gair Company, 155 East 44th street, New York, N. Y.

Chicago, Ill.—The Union Bag and Paper Company, 3725 South Ashland avenue, manufacturer of paper bags and containers, has awarded general contract to the Poirot Construction Company, 2001 West Pershing road, for new one-story addition to plant, about 25 x 36 feet. No estimate of cost announced. Work will be placed under way at once. A. Epstein, 2001 West Pershing road, is architect and engineer.

Longview, Wash.—Pulp Division of Weyerhaeuser Timber Company has plans for new addition to local plant, to be used primarily as a research and experimental laboratory unit. It will be one-story, 32 x 72 feet, reported to cost over $40,000, with equipment and apparatus. Charles W. Lea, Jr., Tacoma Building, Tacoma, Wash., is architect. Superstructure will be placed under way at early date, with A. H. Onstad, construction engineer, in charge.

South Bradford, Pa.—The North Eastern Container Company, manufacturer of corrugated and other boxes and containers, has awarded contract to the Guibert Steel Company, 1716 Youghiogheny avenue, Pittsburgh, Pa., for structural steel framing for new one-story building, 100 x 145 feet, and will proceed with superstructure at once. It will be used largely for storage and distribution, and is estimated to cost close to $40,000, with equipment. R. L. Edwards is company engineer, in charge.

Berlin, N. H.—Fire recently destroyed a building at local Burgess mill of the Brown Company, used primarily for pulp storage service, with loss estimated at close to $16,000, including equipment. It is proposed to rebuild at early date.

Minneapolis, Minn.—The Leslie Paper Company, 301 South Fifth street, paper products, has awarded general contract to Fred R. Comb Company, 2113 Chicago avenue, for one-story addition to storage and distributing plant at 710-12 Fourth street, and will proceed with superstructure at once. John Leslie is president.

San Francisco, Cal.—The Fibreboard Products, Inc., manufacturer of corrugated and other paper board products, with main mill at Antioch, Cal., has approved plans for new addition to storage and distributing plant at Kearny and Francisco street, San Francisco. It will be one-story, reported to cost close to $40,000, with equipment. General erection contract has been let to Lindgren & Swinerton, Inc., 225 Bush street, and work is scheduled to begin at once.

New York, N. Y.—The Pioneer Clip and Tag Company, manufacturer of paper tags, etc., has leased floors in building at 509 East Seventy-second street, and will occupy for local plant.

New York, N. Y.—B. Eckmann, 570 Grand street, manufacturer of paper goods of various kinds, paper novelties, etc., has leased space in building at 39 Broome street, for a local plant. It is proposed to remove present works to new location, increasing capacity.

Detroit, Mich.—The Paper Sales Company of Detroit, Inc., 5300 Wabash avenue, manufacturer of paper goods, plans expansion and improvements in plant and production facilities, including installation of equipment. Company has arranged for financing to net about $480,000, entire fund to be used for purpose noted and for additions to working capital.

Plymouth, Mich.—The Burroughs Adding Machine Company, 6071 Second boulevard, Detroit, Mich., plans establishment of a division for the manufacture of roll paper and other commercial paper goods, in connection with proposed new plant at Plymouth for production of a line of auxiliary products of company. The paper-converting division will be equipped for large output of paper specialties used in conjunction with adding machines and other mechanical office equipment. Company has a tract of 140 acres of land at Plymouth acquired some months ago for plant site. Entire project is reported to cost over $250,000, with equipment.

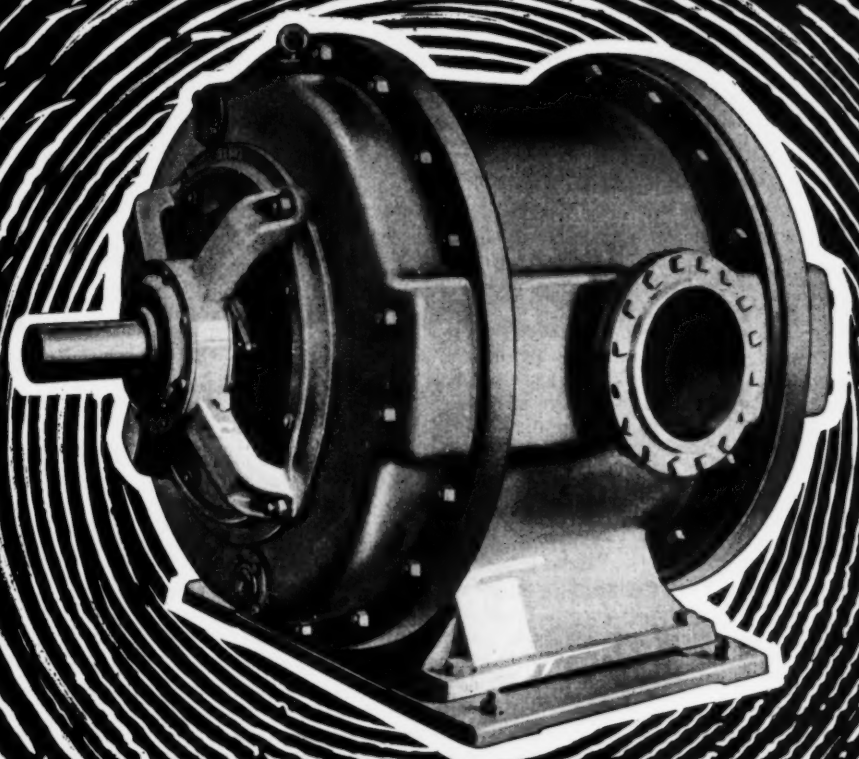
Cornwall, Ont.—The Howard Smith Paper Mills, Ltd., 407 McGill street, Montreal, Que., has approved plans for construction of new two-story plant unit at mill at Smithville, near Cornwall, to be used as a chemical plant, in conjunction with mill operations. Superstructure will be placed under way at once. It is estimated to cost about $70,00, including equipment.

Hantsport, N. S.—The Minas Basin Pulp and Power Company, Ltd., has awarded contract to the Parsons Construction Company, Ltd., Moncton, N. B., for construction of new power dam and power house on St. Croix River, in vicinity of mill at Hantsport, to be used for power service at plant. Work is scheduled to begin at once. Entire development is reported to cost over $250,000, with hydroelectric power equipment.

New Companies

New York, N. Y.—The Central Bag and Paper Company, Inc., has been incorporated with capital of 200 shares of stock, no par value, to deal in paper bags and containers, and other commercial paper products. New company is represented by the Albany Service Company, 315 Broadway, New York.

Centralized Paper Mill Economy



NASH PUMPS

A thousand leading mills have found these pumps the answer to vacuum problems. Simple, efficient, and economical. One moving part, rotating without metallic contact. No pistons, no gears. Ball bearings. Increased vacuum range. These pumps set new standards for performance and economy. Ask for Bulletin No. 236.

THE NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

New York, N. Y.—The Fordham Paper Supply Company has been organized with capital of $10,000, to deal in paper goods of various kinds. New company is represented by Newman & Berkowitz, 123 William street, New York, attorneys.

Brooklyn, N. Y.—The Imperial Blue and Photoprint Company, Inc., has been chartered in Delaware, under direction of the Corporation Fiscal Company, Wilmington, Del., with capital of 500 shares of stock, no par value, to manufacture and deal in blueprint and other special processed papers. The incorporators include Fred. P. Becker, Richmond Hill, L. I.; Gustave Becker, Brooklyn; and George H. Becker, Richmond Hill.

New York, N. Y.—The Carmine Paper and Twine Company, Inc., has been incorporated with capital of 150 shares of stock, no par value, to deal in wrapping papers and other commercial paper stocks. Charles I. Rohrlich, 1440 Broadway, is representative.

Simplification of Film Widths for Micro-Photography of Records

The National Bureau of Standards announces that the proposed simplification program for film used in microphotography has been approved by representatives of those at interest, and the recommendation will become effective August 1, 1936.

Simplified Practice Recommendation R165-36 is intended to serve as the first step in the direction of orderly advancement of the art of copying. It establishes two standard stock widths of motion-picture film for this use, 16 and 35 mm, respectively. Photographic copies made on such film have been variously described as "microcopies," "film slides," "film-stats," etc. It is expected that a uniform nomenclature, international in usage will emerge from a present consideration of terms commonly used in this field.

A representative standing committee will keep the recommendation abreast of current technical research on the relationship of film width to lens systems, sprocket holes in films, recorded image-size, reduction ratio, and film emulsions. The study is being coordinated, to the end that essential apparatus may be designed, built, and distributed, with assurance that abrupt changes in method or technique will not hamper the users.

The printed simplified practice recommendation will contain a brief history of the project. When the publication is ready for distribution it will be announced by the Bureau, and copies will be obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C. Meanwhile, inquiries should be addressed to the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

New Market for Wood Pulp in Turkey

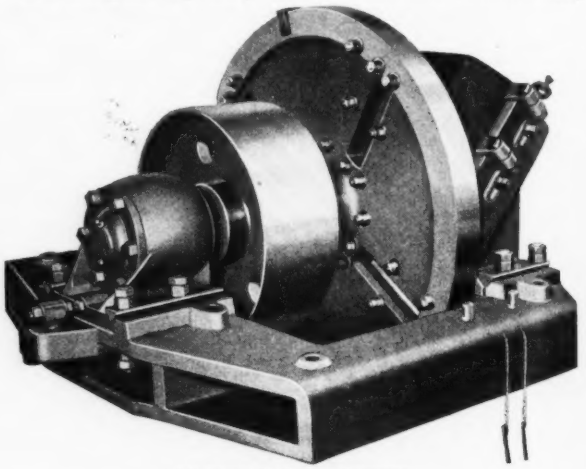
WASHINGTON, D. C., September 2, 1936—Turkey has opened a market for 6,000 tons of woodpulp annually, according to a report from Commercial Attache Julian E. Gillespie, at Istanbul. The Turkish market for woodpulp to be used in the manufacture of paper and paper board is entirely new, but it is a very definite one and in all likelihood its annual requirements will steadily increase up to the point of 10,000 metric tons.

A new paper and paper board mill has been erected and is now in operation at Ismit. It is now producing, the report states, several grades of medium quality writing paper, newsprint, wrapping paper and paper board. No wood pulp is produced in Turkey and the mill is entirely dependent upon foreign sources of supplies for its requirement of woodpulp.

D. J. Murray Makes 50 Inch Chipper

To fill a demand for a chipper in size between the laboratory chipper and the commercial mill size, the D. J. Murray Manufacturing Company, Wausau, Wisconsin, has designed and manufactured a 50 inch chipper. This new chipper is designed and made along the lines of the regular commercial mill size Murray chipper, with all of the improved features of the larger machine.

It is designed especially to handle sawmill refuse, slabs,



MURRAY 50 INCH CHIPPER

edgings, and small round pulpwood. It is adaptable for use in experimental semi-commercial and certain commercial installations.

This 50 inch chipper is illustrated here and in appearance is similar to the regular commercial chipper.

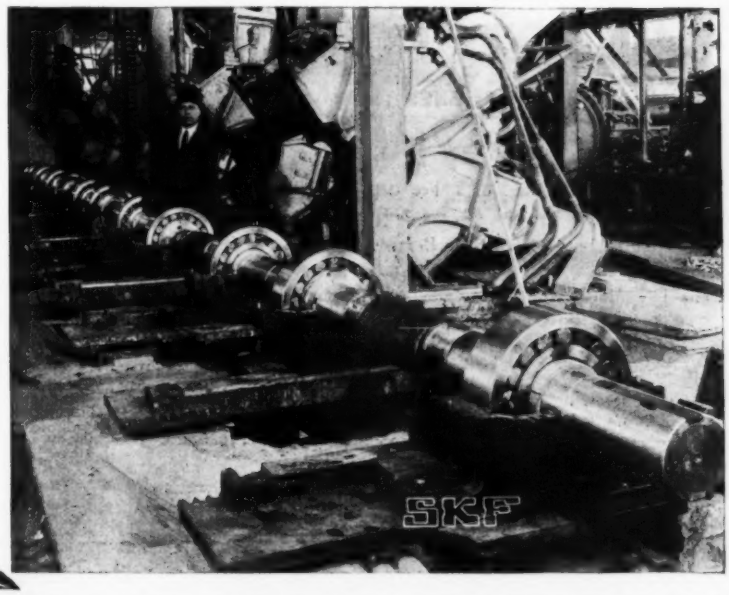
National Safety Council to Meet

The Pulp and Paper Section of the National Safety Council will meet at the Auditorium and the Ambassador Hotel, Atlantic City, N. J., Oct. 5-8, 1936. E. E. Grant of the Crystal Tissue Company will be general chairman.

Among the papers to be presented are the following: "Report of Accident Experience Exchange," by A. E. Winslow of Hollingsworth & Whitney Company; "Groundwood Hazards and Their Elimination," by T. W. Small of Hollingsworth & Whitney; "Selection and Training of Employees in the Paper and Pulp Industry," by H. G. Noyes of the Oxford Paper Company; "Hazards of the Boxboard Industry," by William Elliot of the Inland Container Company; "Papermill Safety from the Supervisor's Standpoint," by George E. Fuller, Finch, Pruyn Company; "Papermill Safety from the Workman's Standpoint," by John L. Sullivan, International Paper Company. There will also be a safety exposition.

Leave Merrimac Paper Co.

H. J. Simmonds, vice-president of the Fitchburg Paper Company, Fitchburg, Mass., announced last week that George R. Wallace, president of the Fitchburg Paper Company, and Mr. Simmonds have resigned as directors of the Merrimac Paper Company, of Lawrence, Mass. John Jansen, Jr., formerly vice-president of the Merrimac Paper Company, is the new president of the company. Mr. Wallace and Mr. Simmonds have no further association of any kind with the Merrimac Paper Company. They will now devote all of their time to the Fitchburg Paper Company.



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ON PULP GRINDERS

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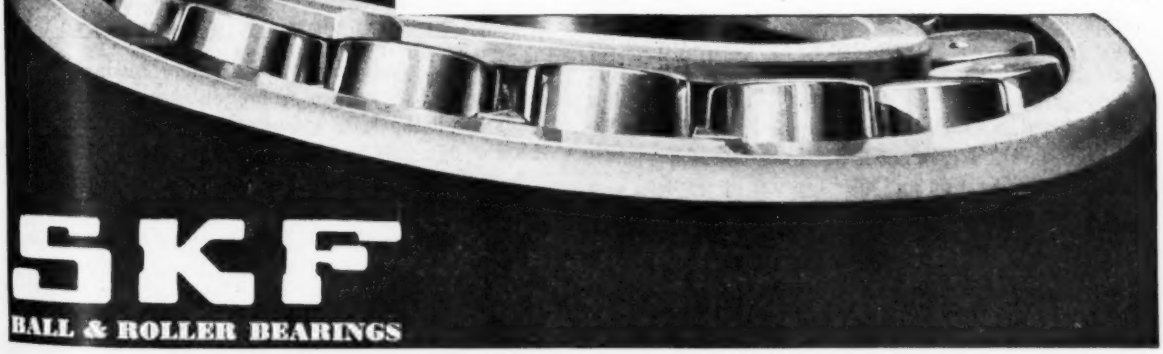

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BALL & ROLLER BEARINGS

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FUTURE MEETINGS

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway, Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

SUGGEST PERMANENCE STANDARDIZATION FOR PRINTING AND WRITING PAPERS

In a paper under the title of "Permanence Standards for Printing and Writing Papers" presented by B. W. Scribner of the National Bureau of Standards staff at the June, 1930, semi-annual meeting of the American Society of Mechanical Engineers as a part of the program of the Printing Industries Session, suggestions were given on standardization of printing and writing papers with respect to their permanence qualities.

It was pointed out that such standards as were commonly in use for the purchase of papers were inadequate, as the grading was based primarily on kind of fiber instead of chemical purity of fiber. Subsequent extensive research at the Bureau and elsewhere has proved without doubt that the stability of paper, as far as its components are concerned, is definitely related to the purity of the cellulose composing the fibers, and that this is dependent on the processing of the fibers and the care taken in the various papermaking operations. Tests of hundreds of commercial papers and papers made experimentally in the Bureau mill have shown that amount of alpha cellulose and the copper number are satisfactory measures of fiber purity. Also that low rosin content and acidity are desirable for good stability. All of these tests have indicated that a classification and specification of printing and writing papers based primarily on chemical purity and strength, suggested in the article are valid, and gives the user of it a much better assurance that the papers will have the required endurance and serviceability.

The experience of the National Government, State Governments, and other large consumers has proved that purchase of materials on definite quality specifications is the only satisfactory system, and paper is no exception. It should be remarked here, though, that the advice of paper technicians, particularly those experienced in the use and manufacture of papers, should be sought in formulating specifications, to make certain that unreasonable requirements are not included.

GERMAN PRODUCTION AT RECORD LEVELS

The increased production which has featured Germany's paper industry in the last two years has been accompanied by a sharp advance in exports and a striking decline in imports, according to a report from the American consulate-general, Frankfort-on-Main, made public by the Commerce Department.

According to official statistics just issued, production of paper in Germany in 1935 totaled 2,203,200 metric tons; board, 569,300 tons; chemical pulp, 1,240,000 tons; and mechanical wood pulp, 912,300 tons. These production data, it is pointed out, are not only substantially higher than those for 1934 but constitute a record production exceeding even that for 1929, the peak year for industrial activity since the war.

During 1936, activity in the paper industry continued to increase, daily production of both paper and board in March being substantially higher than in January and February, the report states.

A number of items in Germany's formerly substantial import trade in paper have been entirely discontinued and others have dwindled to a negligible figure, statistics show. German imports of paper in the first five months of 1936 were valued at only 6,843,000 marks ($2,740,000) compared with 8,562,000 marks ($3,425,000) in the corresponding period of 1935, while the totals for board imports were 407,000 marks ($165,000) and 613,000 marks ($245,000), respectively.

In contrast to the import situation, German exports of paper increased from 41,818,000 marks ($16,727,000) in the first five months of 1935 to 50,854,000 marks ($20,340,000) in the corresponding period of 1936. Outstanding increases were registered in the case of wrapping paper, newsprint, writing, and hanging paper, according to the report.

BUSINESS TREND IS FAVORABLE

In its weekly summary of the general business situation, the Standard Statistics Company states that operating trends in all the leading industries remain favorable, and with the exception of the automobile trade, which is reducing production seasonally, industrial activity is holding close to the highest levels in over six years.

Reports indicate that retail demand for automobiles has been well maintained in August, although the business is, of course, yielding to seasonal influences. Total sales for

the month should be well ahead of the comparable 1935 period.

Automobile production in August will be well below that for July, although indications now are that the year's low point will not be reached until September, after which a vigorous revival is looked for as the manufacturers swing into assembling 1937 models.

Second-quarter earnings reports for the majority of industrial corporations have now been released, and the composite of these reports shows a year-to-year gain of about 77 per cent. Corporate earnings for the current quarter will compare very favorably with those of the similar period a year ago, although the increase is likely to be somewhat less than for the June quarter.

National Paper Trade Studies Merchandising

A new line of activity and study for mutual benefit has been undertaken by the Fine Paper Division of the National Paper Trade Association through a merchandising committee of which J. H. Brewer, Storrs & Bement Company, Boston, is chairman. At the Semi-Annual Convention to be held in Chicago, a special session of fine paper sales executives will be held Wednesday morning, September 23, to consider and discuss the report and recommendations of this committee which will be presented at the fine paper division meeting on the previous day. This special session or forum is designed to test the value of the work done and give the committee the best possible basis for further procedure.

Reports will be made on four of the six subjects which have been worked on under individual leadership as follows:

Sampling—Victor Hecht, Zellerbach Paper Company, San Francisco.

Graphic Processes—A. H. Seyler, Cleveland Paper Company, Cleveland.

Salesmen—Wm. Hentz, Thos. W. Price Company, Philadelphia.

Inventory—J. H. Brewer, Storrs & Bement Company, Boston.

A mass of valuable information and helpful ideas are expected to develop from this new line of association effort. The amount of future activity to be expended and the ground to be covered depend entirely on the interest shown and the participation given, particularly at the special session of sales executives planned as above. The generous work done by the committee merits recognition by a large attendance and it is hoped that they will not be disappointed.

West Virginia Entertains at Mechanicville

[FROM OUR REGULAR CORRESPONDENT]

MECHANICVILLE, N. Y., August 31, 1936—Distributors from the New York and Chicago offices of the West Virginia Pulp and Paper Company were entertained here last week by officials. Luncheon was served in the Elks' Club at which nearly 100 representatives of the company were present. The group later separated, some going to Saratoga Springs, others on a motor trip to Lake George and a few to play golf. Among the officials who were hosts were Thomas H. Stirling, resident manager; George H. Hoover, Sr., George H. Hoover, Jr., John W. Gibson, Lawrence W. Strattner, John Daley, Fred Coe and Howard Hunt. The distributors returned home late in the week.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Month	1936	1935	1934
January	76.1%	65.8%	.....
February	77.9%	70.0%	.....
March	76.0%	70.5%	.....
April	82.3%	70.0%	.....
May	81.6%	69.4%	.....
June	80.7%	72.3%	.....
July (b)	80.1%	67.8%	.....
August	.....	70.9%	.....
September (c)	.....	75.0%	59.4%
October	.....	75.6%	64.7%
November	.....	75.3%	61.7%
December (a)	.....	74.3%	62.1%
Year	.....	71.2%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1936		CORRESPONDING WEEKS, 1935	
*August 8	80.3%	August 10	70.0%
*August 15	81.0%	August 17	70.8%
*August 22	79.0%	August 24	70.4%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: Aug. 8, 1936	Aug. 15, 1936	Aug. 22, 1936
0% to 50%	88	88	66
51% to 100%	240	226	163
Total Mills Reporting	328	314	229

* Subject to revision until all reports are received.
These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

PAPERBOARD OPERATING RATIO

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

1934	1935	1935	1936
Sept. 62%	Jan. 61%	July 59%	Jan. 61%
Oct. 63%	Feb. 67%	Aug. 65%	Feb. 67%
Nov. 56%	March ... 67%	Sept. 69%	March ... 68%
Dec. (a) . 53%	April 61%	Oct. 76%	April 70%
	May 61%	Nov. 70%	May 68%
	June 65%	Dec. 60%	June 68%

Week ending July 4, 1936—65%
Week ending July 11, 1936—53%
Week ending July 18, 1936—71%
Week ending July 25, 1936—70%

Week ending Aug. 1, 1936—74%
Week ending Aug. 8, 1936—71%
Week ending Aug. 15, 1936—74%
Week ending Aug. 22, 1936—75%

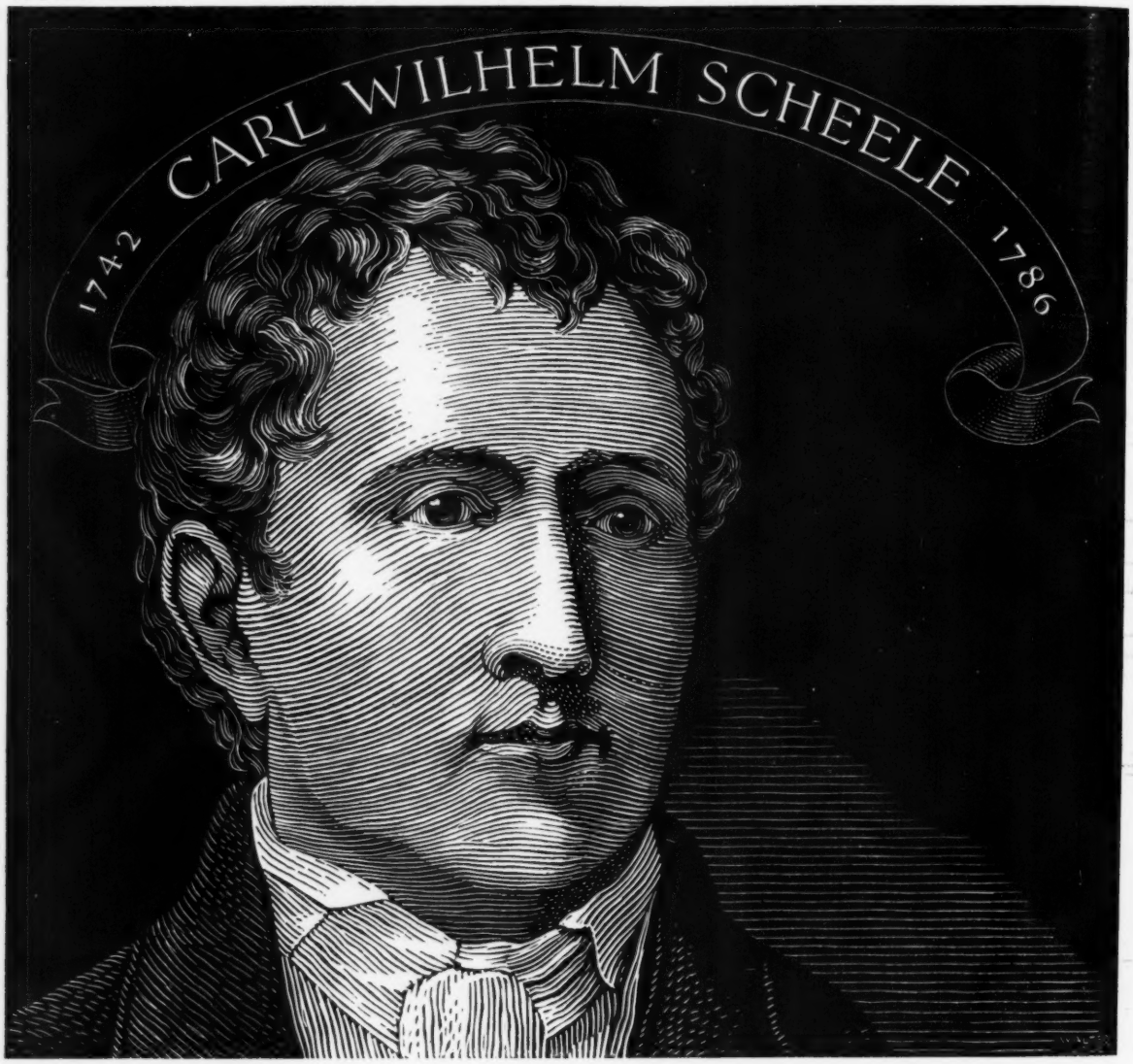
Watertown Section Is More Active

[FROM OUR SPECIAL REPRESENTATIVE]

WATERTOWN, N. Y., August 31, 1936—Paper manufacturers in this section are of the opinion that mills have shown a business increase during the past month of about 25 per cent over the similar period last year and the outlook is regarded as very good. An official of Knowlton Brothers Inc., said that business is the best in several years and the plant is now operating 24 hours daily, six days a week. He said also that all paper mills in this territory are running well and that all are in about the same position as his concern as far as business is concerned. It is his belief that conditions will continue to improve.

An executive of the Bagley & Sewall Company declared that there is no comparison between business conditions in his plant now and those of a year ago. The company is working on two large paper machines and operations are satisfactory. A year ago the volume of business was comparatively low. The company also has a number of overhaul jobs and a large amount of repair work on its books and it is estimated that about 50 per cent more men are being employed than a year ago. The company is trying to observe a schedule of eight hours daily with a half day's work on Saturdays and over 250 men are being employed. Officials consider the outlook brighter now than it has been in several years.

NUMBER SIX OF A SERIES OF FAMOUS PIONEERS IN CHEMICAL HISTORY



IN 1774 Scheele, the Swedish pharmacist, while investigating the properties of manganese dioxide, accidentally produced chlorine. Not recognizing the gas as a new element, Scheele named it "dephlogisticated muriatic acid" in accordance with the "phlogiston" theory of that time. It was some years, however, before Scheele's discovery found commercial application in the form of chloride of lime or bleaching powder, and nearly one hundred and fifty years before the wide usefulness of chlorine was fully realized. Ever since the advent of liquefied chlorine gas, early in the present century, Mathieson has been a pioneer in new developments connected with the production, distribution and efficient application of chlorine and chlorine products.

One of the unique distinctions gained by Scheele was an election to the Swedish Academy of Science, an honor never accorded, before or since, to a student of pharmacy. The greatest chemical discoverer of his age, Scheele's accomplishments were the more striking in contrast with their background. An obscure apothecary, living a solitary life in a small town on the shore of a Scandinavian lake, he was constantly harassed by poverty and debt and was at times the victim of the most depressing melancholy.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Technical Control of Deinking Operations

By P. R. Hines[1] and J. J. Bean[2]

The methods described in the following were developed to meet requirements of accurate comparisons between various deinking systems and have been gradually evolved from several sources. While so far they have only been employed in the laboratory, the experience of the writers in metallurgical work does not show any obstacle to their application to full scale operations.

The methods give the yield from separate stages as well as yield of fiber and filler separately and gross yield. An accurate determination of color is obtained. The auxiliary data supplied, furnishes a basis of evaluating the work and permits accurate comparisons between processes or changes in an existing process.

These methods as outlined are only applicable to those plants deinking old papers containing filler. They are not applicable to newsprint nor to unloaded ledger and bond papers.

J. J. Bean, Metallurgist of the General Engineering Company, Salt Lake City, raised the question frequently of why the "two product" formula based upon three analyses and using ash analysis could not be used in determining yield from deinking operations. The "two product" formula has been in common use among metallurgists for twenty-five years. Three analyses are required, an analysis of one constituent such as copper may be used. The copper is determined in the feed of a process or treatment, a second determination is made of the enriched product and a third analysis of the impoverished product is made. These three analyses are used to calculate algebraically the copper recovered in the enriched product and the copper lost in the improverished product. It enables the metallurgist to determine recoveries at various stages or steps when it is inconvenient to secure weights. It is used also as a check upon calculations employing both weights and analyses. Three product formulas where an enriched product is first made of one metal and a second enriched product of another metal made and a third product which is impoverished but contains a small amount of both metals are in common use. Even when accurate weighing, sampling and analytical work is available to calculate yields, these formulas are used to check the accuracy of the weighing, sampling, and analytical work and if they are not in close agreement careful check is made of all elements for the weighing, sampling and laboratory errors. If the work has been done correctly, the calculated yields will check with returns calculated by weights and analyses to within one per cent over a year's period, and frequently to 0.1 per cent for a like period.

Mr. Bean's question had so many solid facts behind it, it could only be answered by giving serious consideration to the problem of applying it to deinking operations. Deinking as a rule may be conveniently divided into two stages, cooking (defiberizing and loosening the ink), and removing the loosened ink from the defiberized stock (washing).

The cooking stage dissolves a certain amount of cellulose and certain soluble constituents, but scarcely attacks any of the ash making constituents. The two products of cooking are a liquor and a cooled stock. The liquor obviously has no ash content and the total ash remains in the cooked stock. This provides sufficient data to calculate the dissolved loss algebraically from the ash analysis of the original paper and an ash analysis of the cooked stock.

Part of the filler is removed in the second stage with the ink and part remains with the deinked stock. The recovery or yield may be calculated algebraically from ash analyses of the cooked stock, the inky waste and the deinked stock, using a "two product formula". Taking the percentage of cellulose by difference the recovery of the fiber may be calculated. Using the soluble loss calculations and the recovery calculated from the deinking or washing stage, the total recovery of both fiber and filler separately may be made by simple arithmetic, and the two added gives the total overall recovery.

This method requires the taking of four samples, three of which require filtering, and all oven drying before running the ash upon the oven-dry samples. Previously a lot of time was required in measuring total volumes and then splitting off accurate portions for filtering on a screen suction box, the turbid filtrate then being filtered on a Buechner funnel with a weighed filter paper. All of these products required oven drying, weighing, and ash analysis together with considerable calculation to arrive at the total yield. If the original paper was air-dry and weighed, then a separate sample for moisture content was required. The soluble loss was determined by a special run for this figure alone, and it was not convenient to make this determination frequently, so most of the time it was assumed.

[1] Consulting engineer, Portland, Ore.
[2] Metallurgist, Ore Dressing Laboratory, American Cyanamid Company, New York, N. Y.—(Flatation Research Laboratory, Warners, N. Y.)

Ash Analysis Best Procedure

The ash analysis method of determining yield has been carefully checked in the laboratory by weighing methods and agrees within experimental error. More weight is placed upon results calculated from ash analyses than by weighing methods. The many chances for error in weighing and splitting off fractional volumes errors from bad manipulation, and the moisture factor, are greater than a simple well taken dip sample for ash determination.

All samples being oven-dried for the ash analysis eliminates all moisture corrections. There are some possible chances of error in the ash analysis method of determining yield, but these are small in amount from a practical standpoint.

The derivation of the formulas and their application to an actual worked out illustration will serve better as an explanation than any other means. The derivation of the formula for calculating the soluble loss by cooking from two ash analyses is given below.

Let r be the per cent Ash in the original paper.
c be the per cent Ash in the cooked stock.
s be the per cent of soluble loss.

$$(1)\quad \frac{r}{100\text{-}s} \times 100 = c$$

$$(2)\quad 100\ r = c(100\text{-}s)$$

$$(3)\quad 100\ r = 100c\text{-}cs$$

$$(4)\quad cs = 100c\text{-}100r$$

$$(5)\quad s = \frac{100\ (c\text{-}r)}{c}$$

Example:

$r = 24.73$ per cent ash
$c = 25.87$ per cent ash

$$s = \frac{100\ (25.87 - 24.73)}{25.87} = 4.40 \text{ per cent soluble loss.}$$

The Two Product Formula

The derivation of the "two product" formula used to calculate the recovery of fiber and filler using three analyses, the ash analysis respectively of the cooked stock, the ink waste, and the deinked stock, is given below. The reader is referred to "Handbook of Ore Dressing" by Taggart, John Wiley & Sons Publishers for a complete discussion of calculations of this kind.

Let c = Per cent ash in cooked stock C = weight of cooked stock
w = Per cent ash in cooked stock W = weight of washed stock
d = Per cent ash in cooked stock D = weight of inky waste
R = Recovery or yield of ash or filler in washed stock.

$$(6)\quad C = W + D$$

$$(7)\quad Cc = Ww + Dd$$

Multiplying (6) by "d"

$$Cd = Wd + Dd$$

$$Cc = Ww + Dd$$

$$Cd - Cc = Wd - Ww$$

$$C(d - c) = W(d - w)$$

$$(9)\quad C = \frac{W(d - w)}{(d - c)}$$

$$(10)\quad R = \frac{100\ Ww}{Cc}$$

Substituting the value of C from (9) in equation (10)

$$R = \frac{100\ Ww}{\frac{W(d - w) \times c}{(d - c)}} = \frac{100\ Ww\ (d - c)}{Wc\ (d - w)}$$

$$(11)\quad R = \frac{100\ w\ (d - c)}{c\ (d - w)}$$

Example

$c = 25.87$ per cent ash in cooked stock
$w = 2.33$ per cent ash in washed stock
$d = 67.55$ per cent ash in dirty inky waste

$$R = \frac{100\ w\ (d - c)}{c\ (d - w)} = \frac{100 \times 2.33\ (67.55 - 25.87)}{25.87\ (67.55 - 2.33)} = \frac{100 \times 2.33 \times 41.68}{25.87 \times 65.22} = 5.76 \text{ per cent recovery of filler in washed stock.}$$

Fiber

$c = 100\% - 25.87\% = 74.13\%$ fiber in cooked stock
$w = 100\% - 2.33\% = 97.67\%$ fiber in washed stock
$d = 100\% - 67.55\% = 32.45\%$ fiber in inky waste.

$$R = \frac{100 \times 97.67\ (32.45 - 74.13)}{74.13\ (32.45 - 97.67)} = \frac{100 \times 97.67 \times 41.68}{74.13 \times 65.22} =$$

84.2 per cent recovery of the fiber in the washed stock by washing moulds.

TABULATED RECOVERIES AND LOSSES IN WASHING THE COOKED STOCK.

	Washed Stock	Dirty Waste	Total
Fiber	84.2%	15.8%	100%
Filler	5.76%	94.24%	100%

100.00% — 24.73% = 75.27% fiber in raw paper
75.27% — 4.40% = 70.87% fiber in cooked stock, based on raw paper.

Checking the above.
100.00 — 4.40% (soluble loss) = 95.60% weight of cooked stock.
95.60% × 25.87 (per cent ash) = 24.73% weight of ash.
95.60% — 24.73 = 70.87% of fiber.

Fiber
70.87% fiber × 84.2% recovery = 59.67% of original paper, Yield
70.87% — 59.67% = 11.20% of original paper, Loss.

Filler
24.73% filler × 5.76% recovery = 1.42% of original paper, Yield
24.73% filler — 1.42% = 23.31% of original paper, Loss.

TABULATED RECOVERIES AND LOSSES BASED ON ORIGINAL WEIGHT OF PAPER

	Yield	Loss
Soluble Loss	....	4.40%
Fiber	59.67%	11.20%
Filler	1.42%	23.31%
Total	61.09%	38.91%

61.09% + 38.91% 100.00% original weight of paper.

The above illustrates how calculations from four ash analyses will give not only the gross yield but what this yield consists of, and the recoveries and losses for various stages. This can be carried further in certain deinking processes to cover three or more stages.

Color

The laboratory sheets made to determine color must have the same amount of the filler retained in the sheet as contained in the washed stock. The filler remaining in the washed stock is slightly darker than the original filler. Consequently the sheet must be made in a white water made up from the washed stock filler.

If the sheet is made upon an ordinary laboratory sheet mould using fresh clean water, the effect is equivalent to giving the stock a second washing treatment and a more intensive washing than it received originally in plant operations.

Taking for example a sheet mould making an 8" x 8" sheet, and filling with water 2 inches above the wires, the volume of fresh water is aproximately two liters. If a four gram sheet is made, this gives a ratio of water to stock by weight of 500:1. This gives the stock a very vigorous wash and removes practically all of the filler. Plant operations wash the stock to 2.5 to 4.0 per cent ash as a rule. A sheet made with fresh water may be four points higher than the true color.

A paper entitled "A Study of the Factors Influencing the Brightness of Paper" by Laughlin and Kress, (Tech. Assoc. Papers, XVIII:169-181 (1935)), shows the variations in brightness with different fillers and different stocks, in a very clear way.

An example of sheets from laboratory washed stock shows this feature very plainly,

Sheet No.	Per cent Ash	Color
1	3.1	71⅛
2	2.1	72⅜
3	1.9	73⅞

The three sheets above were made from the same washed stock and show the variation in color according to the amount of old filler retained in the sheet.

Sheet Making Procedure

The method given for making sheets to determine color given below is based upon a method used by the Oxford Research Company, Laboratory, Oxford Paper Co., Rumford, Maine. It has been modified to save time. If the stock is washed to about the same degree of ash, and sheets made upon the same sheet mould, the number of sheets required can be reduced to four or less. Special conditions may require as many as eight sheets.

A sheet mould of the type shown in Fig. 1 is used and any standard laboratory sheet mould can be remodeled for this work. A is the sheet mould, B is a funnel and pipe

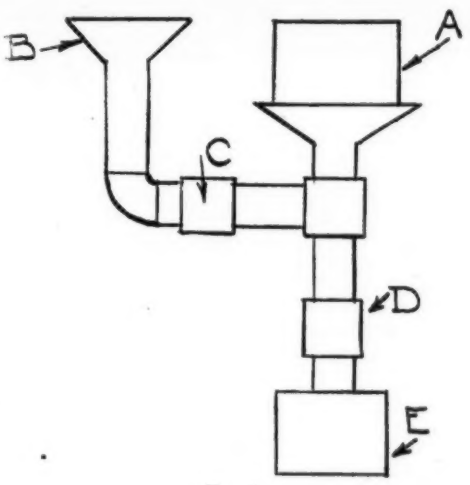

FIG. 1

used to fill the sheet mould to the proper level, C is a quick opening valve, D is a short pipe leg equipped with a quick opening valve, which discharges into a small g.i. garbage can E.

The volume of the system should run somewhere near 12 liters or less. A white water is made up which will fill the complete sheet mould to a proper level when C is open and D is closed. The white water is made up from the filler in the washed stock. Sufficient washed stock to equal 150-200 grams air-dry weight is thoroughly screened and washed and the fiber used to make up the white water. The stock from the washing and screening is made up with water to any convenient volume so that a proper amount may be measured out to give the desired weight of sheet. The sheet mould is filled with the white water to proper level, C is then closed and D opened and sheet formed and removed. The white water draining into E is then returned and a second sheet is made, etc. The object being to get a sufficiently saturated white water so the retention of the first sheet is slightly greater than the ash content of the washed stock. Each succeeding sheet contains less and less ash until one is secured corresponding in ash content to the ash content of the washed stock.

The sheets are finished in the regular manner. The top and bottom sides are read upon a colorimeter in two places each side and averaged. The sheets are then run for ash to find out which sheet corresponds to the washed stock. The corresponding sheet is thus determined and its color reading used for the correct color of the stock.

The color determinations in this case were read upon a photronic cell using magnesia white as a standard at 100 per cent. The colorimeter was of the type developed by S. W. Blanchard of the Crown Willamette Paper Company, West Linn, Ore., and used for daily control work in their own plants. It has also been adopted by other companies on the Pacific Coast.

Deinking Factor

A deinking factor adopted for comparisons of different work is the product of the color times the gross yield. This factor is practically a straight line where the original paper is the same content of filler and containing about the same type of mixed magazines. The deinking factor reduces comparative tests to a common denominator. It is very difficult to hold test work of this kind to a constant color permitting the yield to vary or vice versa. The deinking factor takes care of these slight differences and permits the work to be compared directly.

Interpretation of Results

Table I shows a typical laboratory washing test tabulated. This was run under constant conditions varying the amount of washing given the stock.

The gross yield is given in the 2nd column and the color in the 3rd column. The deinking factor is the product of these two given in the 4th column. It will be noticed that 1.5 per cent increase in yield lowers the color about 1 per cent.

"Recovery in Washing Stage" column shows the per cent recovered by washing from the fiber and filler available in the cooked stock. This shows how efficient the washing operations were. The gross recovery shows the percentage of the original paper finally recovered first as filler and then as fiber, these two added together give the gross yield in column 2. The soluble loss occurring in the cooking operation is next given.

The ash analyses of the inky waste and of the washed stock are next given. The ash analysis of the inky waste gives a very good idea of the losses if records over a con-

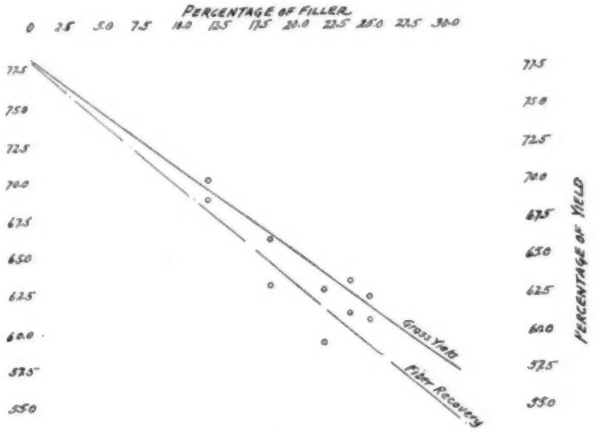

FIG. 2

Plot of gross yield and fiber yield from old magazines with varying filler content and loading from laboratory studies of low density cooking and washing process for deinking.

TABLE I.—LAB STUDIES OF LOW DENSITY COOKING AND WASHING PROCESS FOR DEINKING

Test No.	Gross Yield	Color	Factor	Recovery in Product Per cent of Cooked Stock by Washing		Gross Yield As		Soluble Loss	Ash Analyses								Cook				Washing		Remarks
									Raw Paper		Cooked Stock		Washed Stock		Dirty Washings								Old Magazines
																							⅔ 1933-35
				Filler	Fiber	Filler	Fiber		Filler	Fiber	Filler	Fiber	Filler	Fiber	Filler	Fiber	Amount	NaOH	Time	Temp.	Amount	No. of Washes, 1½ Liters Each	⅓ Prior to 1933
475	62.7	71⅛	4460	8.0%	85.7%	2.0%	60.7	4.4%	24.73	75.27	25.87	74.13	3.14	96.86	69.16	30.84							Ash Analyzed
473	61.1	72⅜	4422	5.8%	84.2%	1.4%	59.7	4.4%	24.73	75.27	25.87	74.13	2.33	97.67	67.55	32.45	325 gr.	13.0 gr.	4 hr.	208° F.	100 gr.	Two	35.6% $CaCO_3$
474	59.5	73⅞	4347	4.6%	82.4%	1.1%	58.4	4.4%	24.73	75.27	25.87	74.13	1.90	98.10	65.39	34.61					100 gr.	Three	
																					100 gr.	Four	

siderable time are available. The ash analysis of the washed stock gives a very good idea of the color of the stock produced to those who are experienced. If sufficient technical control work of this kind has been done and recorded, a single ash analysis tells a whole story.

Fig. 2 is a plot of a series of accumulated washing tests reduced to a common color factor. The ordinates are the percentage of filler in the original paper before deinking and the percentage yield. The upper line being the gross yield and the lower line being the yield of fiber.

Inspection of this curve shows that the yield is a function of the percentage of filler in the original raw paper when the ink is washed out. The curve is for practical purposes a straight line. This plot shows distinctly that the statement of yield gives no indication of the relative efficiency of a deinking plant operation unless the percentage of filler in the paper being deinked is known.

As stated above, the yield is a function of the color washed to, so that a statement of gross yield must be qualified by both the percentage of filler in the raw paper and the color of the washed stock to give any operating information.

Equally important in comparing new processes is the relative amounts of filler and fiber which go to make up the yield.

Returning to the use of four ash analyses to calculate yield and efficiency of operations, the following is now apparent. The percentage of filler in the raw paper is necessary to evaluate the gross yield figures and efficiency of the deinking operations. The ash analysis of the washed product is necessary to gain an idea of the thoroughness of the washing and to give the relative fiber and filler recoveries. So two of these four ash analyses are essential for interpretation of results regardless of the method for determining yield. The ash analysis of the washed stock is necessary for a correct color determination as well.

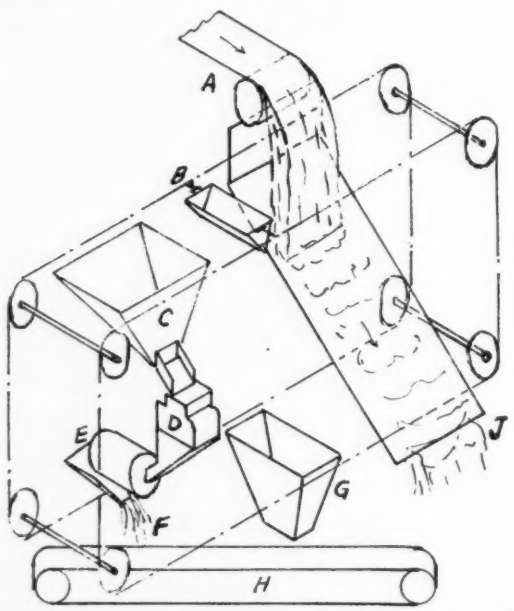

FIG. 3

Scheme for automatically sampling shredded old papers in deinking operations. A. Belt conveyor discharging shredded paper. B. Chain and bucket sampler pivoted bucket. C. Bucket B dumps into sample bin C. D. Fine shredder for sample. E. Mixing and equalizing drum. F. Lower run of chain and bucket sampler for making second sample cut on paper from E. G. Bucket B dumps at G final sample bin. H. Belt conveyor returning sample rejects to J. J. Chute carrying main stream of paper over bottom run of chain sampler.

The washing test tabulated was given a more thorough washing than common plant practice, the ash content being from 1.9 to 3.1 per cent. Usual practice being from 2.5 to 4.0 per cent ash content in the washed stock. The paper deinked was a mixture of one third of general run of magazines prior to 1933 and two thirds of magazines dated 1933 to 1935. The proportion of calcium carbonate filled stock is shown by the ash analysis. The ash ran 24.73 per cent and the ash analyzed 35.6 per cent $CaCO_3$ (calcium carbonate). Laboratory work confirms the experience of one paper plane who finds the percentage of filler is rising in their waste magazines. This accounts for the drop they have noticed in their yield.

Consequently while the yields calculated from ash analysis look suspiciously low and considerably under the accepted practice with a yield of 70-73 per cent, there are good reasons for this as stated above. There is a gradual change appearing in the waste magazines as more and more of the calcium carbonate filled papers appear in the waste collections. The amount of filler is raising, causing a drop from the yields of several years ago. Because of accurate color determinations this laboratory work has had an upward tendency towards better color due to actually seeing the true color of the deinked stock. Ignorance of the true color of the washed stock when made into paper upon the paper machine permits inefficiency to go on undisturbed for months at a time. The practice of making sheets from deinked stock with fresh water is a very dangerous method, and is worse than none. The percentage ash in the washed stock is a better guide to the actual color failing means to make correct color determinations.

Waste magazines over a month's period for plant operations will average fairly close. Laboratory washing work shows, however, that coated papers will give a much higher color and brighter stock than uncoated. This is of course apparent as the coating protects the fibers from the ink. The higher filler content makes for a lower yield from coated stock. Antique book (uncoated) gives a very high yield due to low filler content but the ink is very difficult to loosen and the color is lower unless longer cooking period is maintained. These variations affect the deinking factor. As a rule average conditions in the waste papers being handled will permit using the deinking factor to prophesy expectations in the washed stock. As an example with a deinking factor of 44.20, if it is desired to keep the color of the product around 70, the yield will be 44.20/70 giving 63 per cent. This enables the operations to be carried on at the point giving a maximum return.

Sampling Actual Mill Operations

The application of this method of determining yield presents no difficulties when the paper is shredded in the first stage of the deinking operations. This will be taken up first, as applied to the "low density cooking and washing system."

The sampling of shredded paper is analogous to sampling coarsely crushed ore. The main difference being the reducing of the first sample cut to a finely shredded condition so the sample may be reduced to a convenient size.

The sketch Fig. 3 shows a scheme for sampling shredded paper. The sampler is a bucket suspended from two light malleable chains driven from a head shaft with two sprockets and arranged to pass transversely through the stream of shredded paper going to the breaker beaters or cookers. The speed of the chains should be such in relation to the size of the bucket, so the bucket will not be filled to overflowing when cutting out a portion of the

stream. The length of one of the strands and the width of the bucket give the ratio of sample taken to the total paper. An 8 inch wide bucket mounted on strand of chain approximately 67 feet long upon 33.5 feet centers would make a sample cut of one per cent of the paper being treated.

The sample bucket would deliver and dump into the hopper of a small hammer mill arranged for fine shredding. These small hammer mills are very inexpensive. The finely shredded paper should be delivered to a small revolving drum to mix the paper sample, and hold back the intermittent delivery and form a continuous stream. A second cut with a chain sampler taking a one per cent cut would give a sample convenient to handle in the laboratory, for ash analysis of the raw waste paper.

Electrically operated automatic samplers are available at reasonable prices and in several types and makes. They are made for suitably sampling wet stocks and pulps. Three of these would be required for collecting the other three samples, of the cooked stock, the washed stock and the inky waste water. These samplers are arranged to cut the stream of stock transversely at appropriate intervals of time. The time may be varied to suit conditions and size of sample required. The stock should be delivered from a small launder or flume giving a rectangular cross section of dropping stream to the sampler.

The samples are collected in buckets and at the end of the shift are sent to the laboratory. The sample may be thoroughly mixed by agitation and a dip sample taken for filtering, oven drying and running for ash.

The installed cost should run about $1500 to $2000 for the two chain samplers, hammer mill; and three automatic samplers. The rejects from the sampling of the raw paper would be returned by chute or conveyor to the main stream.

If the deinking operation consists of several stages, i.e., three or more and it is desired to check the stages separately, two more or a total of six samples would be required for a three stage process, and so forth.

The case of the rotary boiler high density cooking system presents a more expensive problem to sample the paper correctly. Sampling experience would indicate a cut of 10 per cent of the unshredded paper would be required. This 10 per cent sample would then require shredding in a heavy shredder and the shredded paper would then be sampled as described above. A shredder of this type is far more expensive on account of the heavy magazines dealt with.

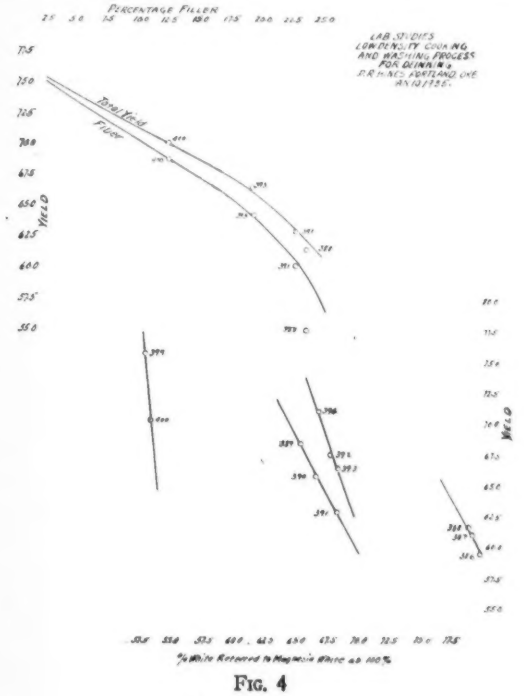

FIG. 4

Considerable and reliable information may be obtained by hand sampling. It is possible to arrange a sliding box so a portion of the shredded paper may be cut out at 15 to 30 minute intervals during a shift. The shredded paper may be ignited and reduced to a partial ash after drying and weighing. This ask may then be ground and mixed and used for a final ash.

Hand sampling of the stock may be accomplished at some point where there is a free falling stream. A sampling spoon should be used and it should have a narrow rectangular mouth long enough to cut the full depth of the stream, and with sufficient capacity below the mouth so no losses occur from splashing or overflowing. A sampling spoon moved evenly across the streams cross section will give a reliable sample. The hand sampling should be done at regular intervals taking each sample in rotation and collected in buckets. Shift samples of this kind are as reliable as antomatic sampling if carefully done by one man but are not satisfactory if the sampling is turned over to the operators.

Conclusions

The above method has been well tested out in the laboratory and from the writer's experience this method gives greater confidence in the results and saves considerable time over previous methods used. As applied to operating work, this method may be applied in exactly the same manner as metallurgical sampling and methods in common use and well tried out for several generations.

The only feature which requires a change from established practice is in the handling of the raw paper sample. The question of reducing the sample to a sufficient degree of fineness so a representative portion may be weighed out for ash analysis of convenient size is different. When special equipment is not available for fine shredding we believe a large sample may always be dealt with by first oven drying the large sample, weighing, and burning it; then completing the ash analysis upon the burned portion. Burned paper may always be pulverized and mixed sufficiently so it can be cut down further to a convenient amount for laboratory work.

New Forged Steel Flange List

The Kropp Forge Company, Chicago, makers of forged steel flanges, have recently issued a 24-page list of stock flanges.

This stock flanges list includes dimension, weights, and prices on standard flanges in all sizes from ¾ to 24 inches, and engineering data on standard flange facings, drilling templates, pressure-temperature ratings, threading standards, bursting pressures, and dimensions of standard, extra heavy, and double extra heavy pipe.

Listings include standard, extra heavy, double hub and high hub boiler flanges, welding flanges and spuds, horseshoe, offset, tank and marine flanges, threaded, slip-on, van stone, welding neck and reducing companion flanges, blind flanges, etc.

A copy of this valuable and most complete flange list will be sent to all designers, engineers, and flange users who can use it for ready reference for the usable engineering data it contains. In writing the Kropp Forge Company for this list, ask for Bulletin No. 125.

Forming and Testing Pulp Sheets*

This standard deals with a precision method of forming test sheets from pulps of whatever nature, or after being accorded any degree of beating, and of testing the resulting sheets for their physical properties. In the appendix is described a method for accurately determining the drainage time and drainage factor, which results may for most purposes replace freeness measurements.

The method has been drafted with two objects in view, first, to duplicate as far as possible the average conditions under which pulp is commercially made into paper, and second, to provide an accurate method with which any existing pulp testing method may be compared so as to obtain factors to convert the test figures to standard results having an international significance.

Apparatus

(1) Standard disintegrator.
(2) Standard sheet machine with stirrer.
(3) Standard couch roll.
(4) Standard couch plate.
(5) Standard pump and press with pressure gage.
(6) Press template for centering the sheets and plates in the press.
(7) Seven or more mirror-polished disks, 6¼ inches in diameter.
(8) Eight or more drying rings with rubber seatings for holding the sheets to the polished disks during drying. Specifications for the above equipment with illustrations are in Appendix A.
(9) A quantity of sheets of standard blotting paper, 8 inches square, 0.0195-0.0205 inch thick, weighing 245-255 grams per sq. m. and having an absorbency such that when strips are immersed in distilled water at 15 deg. C., the average height to which the water rises in both machine and cross directions is from 40 to 60 mm.[1]

[1] If the absorbency of the blotting paper is much greater than that stated, difficulty may be experienced in couching certain treated or very fine'y ground pulps. Paper according to specification may be obtained from the Wrenn Paper Company, Middletown, Ohio.

(10) One 500-cc. enameled cup.
(11) One bucket with mark at 16 liters.
(12) One 1000-cc. graduated cylinder.

Sampling

When dealing with mill consignments, a sample of pulp, the equivalent of about 4 square inches in area, shall be drawn from the interior of every bale included in the official test for moisture (disks bored for the moisture test but *not* dried may be used); or, in the case of a shipment of chemical pulp where the cook numbers are known, the number of samples shall be proportional to the number of bales representing each cook, provided no fewer than 3 samples from each cook are obtained. When neither of these methods is possible, a sufficient number of samples shall be selected in such a way as to be representative of the whole consignment. The weight of the sample shall be equivalent to at least 100 grams of dry fiber.

Storage of Pulp Samples

Moist pulp samples should be stored under water with a few drops of formaldehyde and kept in a cool place away from direct sunlight. Dry pulp samples should be stored in suitable packages away from heat or light.

* Revision of Method T205m.

Test Specimen

Weigh out to the nearest 0.5 gram a representative sample of the pulp obtained by *tearing* equal portions from all the samples collected, equivalent to 24 grams of oven-dry fiber. Do not cut the pulp or use cut edges. If the sample is dry, wet it in cold water, tear into pieces about 1 inch square and soak in water for 4 hours; or in the case of a dried sample of mechanical pulp which is to be furnished in the moist form, allow it to soak for 24 hours.

Note: As far as is known, soaking pulp for a longer time, for example over night, does not appreciably affect the results.

Procedure

Disintegration

Make the mixture up to 2000 cc. with cold water (1.2 per cent consistency) and disintegrate for 75,000 revolutions in the standard disintegrator with the propeller running at 3000 r.p.m. in the stock. After disintegration, dilute the stock to 16 liters with cold water (0.15 per cent consistency).

Sheet Making

Partially fill the sheet-machine container with water, taking care that the needle valve is closed. Then let out the water until its level is just above the wire, so as to ensure driving out all the air from beneath the wire. Accurately measure out and pour into the container 800 cc. of the well mixed, dilute stock at 0.15 per cent consistency; the water supply being simultaneously turned on until the depth of the dilute suspension is 35 cm. above the wire surface.

Note: The ultimate requirements are sheets each weighing between 1.14 and 1.26 grams dry, corresponding to a substance of 60 grams per sq. m. (42.7 pounds, 25 x 40 — 500), with a tolerance of 5 per cent. Consequently for a finely divided pulp, slightly more than 800 cc. should be added, for example 840 cc. for an average groundwood pulp, to allow for a 5 per cent fiber loss through the wire.

Insert the perforated stirrer and in 6 seconds move it steadily down and up six times, keeping the disk beneath the level of the liquid. Repeat this double movement very slowly, once in 10 seconds, and gently withdraw the stirrer. After a pause of 10 seconds, during which time the surface of the liquid should have become almost motionless, fully open the drain cock of the machine with a rapid movement and let all the water drain from the sheet under suction. Immediately after the water has drained from the sheet, tilt the container and couch the sheet off the wire. Unless the machine is of the new pattern with an air inlet groove at the side of the grid plate, open the needle valve before couching.

Couching

Lay two pieces of standard blotting paper centrally on the pulp sheet on the wire. Now lay the flat brass couch plate centrally on the blotters and place the brass couch roll gently on the middle of the plate. Move the roll backward, no other pressure being applied, to within less than ¼ inch of the edge of the plate, which is maintained horizontal by placing the fingers on the opposite edge; then forward to within less than ¼ inch of the front edge; then back and forth four times; and finally to the middle; then lift off the roll. The time taken to perform the five complete rolls shall be about 20 seconds.

Remove the pulp sheet and blotters and covering brass plate from the wire in a manner similar to that of opening the cover of a book, when the sheet will be found adhering to the blotter next to it (the couch blotter). Immediately detach the couch blotter and sheet from the other

blotter (couch filler) and plate, and by means of the press template, lay it centrally, test sheet uppermost, on one dry blotter (the press filler) which has been previously placed in the press. Place a mirror-polished plate on the test sheet and cover with another press filler, ready to receive the next couch blotter and sheet.

Wash the wire in the sheet machine in position by turning on the water, and make the next test sheet in precisely the same way. Make a minimum of 7 sheets in all so that the stack in the press when complete will consist of press filler, couch blotter, sheet and plate, repeated 7 times. Finally lay a single blotter on the uppermost plate to avoid possible damage to the press cover.

First Pressing

Put on the cover of the press and screw the wing nuts down hand-tight. Raise the pressure, as indicated by the gage, to 50 lb. per sq. in. in ½ minute from the time the needle begins to move, and maintain it there for 5 minutes. At the end of that time release the pressure and remove the press cover.

Second Pressing

After the first pressing, remove the polished plates with test sheets attached from the stack of moist blotters. Using the press template, lay the plate that was on top of the stack during the first pressing centrally on a dry blotter, test sheet uppermost, and cover the sheet with one new blotter. This blotter also serves as a base for the next plate and test sheet. The stack so built on a foundation blotter will comprise plate, sheet and press filler, repeated 7 times. The order of the sheets is thus reversed in the second pressing. Place the cover in position as before and raise the pressure rapidly to 50 lbs. per sq. in. as indicated by the gage and keep it there for 2 minutes. (There is no necessity to fix a time period for attaining the stipulated pressure in the second pressing, as the tendency for the pressure to fall off, is very much less than before).

During couching and pressing, the felt sides of the blotters and not the wire sides shall be in contact with the sheets and, for precise work, it is desirable that those in contact with the sheet be new blotters.

Drying

Remove the stack from the press and fit the plates with the attached test sheets into a set of drying rings, each test sheet uppermost and in contact with the rubber of the next ring, and place a heavy weight on top of the pile. The sheets shall be fully dried in this position before removal.

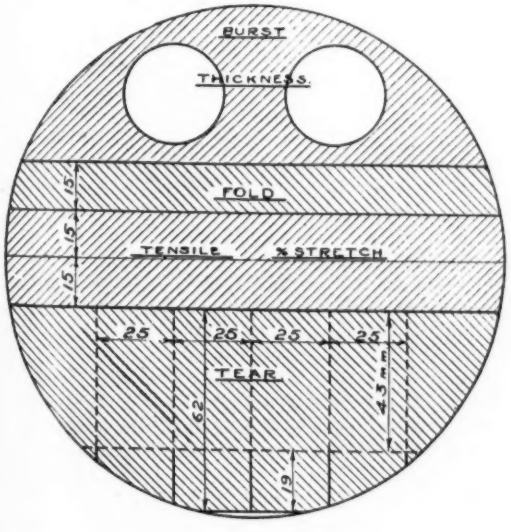

FIG. 1
Division of Sheets for Testing

Note: If there is a shortage of drying rings when making sheets from relatively free stock, it is possible to clamp 2 sheets, with their plates back to back, between each pair of drying rings.

Conditioning

The sheets shall be kept in an atmosphere of 65 ± 2 per cent relative humidity and 65-70 deg. F. ± 3 until they attain equilibrium as to moisture content, which shall be determined by accurate weighings at not less than half-hour intervals.

Note: With a suitable arrangement for circulating conditioned air over the sheets, they may be dried and conditioned in from 1 to 2 hours. The time also depends on the degree to which the stock has been beaten.

Sheets, especially groundwood sheets, shall be tested within a day after they have been made.

Testing of Sheets

The sheets shall be tested according to the TAPPI standard paper testing methods, unless otherwise specified, for such characteristics as may be desired. Fig. 1 shows a convenient method of dividing and using 6 test sheets for determining all the usual tests.

Basis Weight

After conditioning, determine the average basis weight of the sheets by weighing them on a balance sensitive to 2 mg.

The area of each sheet (6 9/32 inches diameter) is 200 sq. cm. Hence if n is the number of sheets in a group weighing w grams, the basis weight is $50\ w/n$ grams per sq. m., air-dry basis. The oven-dry basis weight is obtained by multiplying this value by the dryness factor (see Moisture, below).

Thickness

Measure the average thickness of 6 test sheets together, placing the glazed surfaces of the individual sheets in the same direction during the test. For precision use a micrometer having a pressure foot 14-15 mm. in diameter and a closing pressure of 0.7-0.9 kg.

Tensile Strength and Stretch

Use at least 12 strips from 6 test sheets cut 15 mm. wide. The jaws of the tensile tester shall be 90-100 mm. apart and the load shall be gradually increased at such a rate that fracture shall occur in from 10 to 30 seconds. (For precise work the time to fracture should be near to 20 seconds.)

Bursting Strength

Determine the bursting strength by making at least 12 bursts on 6 test sheets, the glazed side of each sheet being clamped towards the diaphragm.

Tearing Strength

Determine the tearing strength on a calibrated[2] Elmendorf tearing tester by suitably dividing portions from 6 test sheets and making 5 tears each through a total tearing distance of 25.8 cm. (6 x 4.3) as shown in Fig. 1.

Note: The readings on the Thwing-Elmendorf are multiplied by 16/6 (= 2 2/3) to give the grams force to tear a single sheet. If a Marx-Elmendorf tester is used the 5 tears are made similarly but each through a total tearing distance of 26.4 cm. (6 x 4.4). The reading on this instrument under these conditions gives directly the grams force required to tear a single sheet.

Moisture

When the tests are completed, collect about 2 grams of the scraps of any of the test sheets, weigh them (y grams),

[2] See TAPPI Standard T 414 m.

place in an oven at 105 deg. C. and dry until no further loss of weight occurs; then place them in a tared weighing bottle which has been kept in a desiccator. Replace the bottle in the desiccator and let it cool. Open the stopper to let in the air, close it immediately and weigh the bottle to determine the dry weight of the scraps (z grams).

The percentage moisture content of the sheets under standard atmospheric conditions is then: $100\frac{(y-z)}{y}$. The dryness factor is: $\frac{z}{y}$. Hence the oven-dry basis weight, in grams per sq. m., is: $\frac{(50w)\ (z)}{(n)\ (y)}$. (See under Basis Weight, above.)

OTHER TESTS

If desired, other tests such as folding, opacity, porosity, finish (unglazed side), stiffness, color, etc., may be made according to standard procedures.

Report

Results shall be reported to the nearest third significant figure. For the direct test results either (1) metric or (2) English units may be used, the unit being stated in each case. For *derived* units, such as the various strength factors, the metric system is standard, and such units shall be assumed to be calculated in the metric system unless definitely stated to be otherwise.

The calculations of the various items reported are shown below by formulas in which:

r = basis weight in grams per sq. m. (oven-dry basis);
R = basis weight in pounds per 500 sheets, 25 x 40 inches (oven-dry basis);
t = thickness of single sheet in 1/1000 mm.;
T = thickness of single sheet in 1/1000 inch;
b = bursting strength in grams per sq. cm.
B = bursting strength in pounds per sq. in.;
p = tensile break load in kg. on 15-mm. strip;
P = tensile break load in pounds on 15-mm. strip;
e = force in grams to tear a single sheet.

Note: $R = 0.711\ r$; $t = 25.4\ T$; $b = 70.3\ B$.

Basis Weight: In grams per sq. m. (oven-dry basis).
Moisture: As percentage.

Bulk (Apparent Specific Volume): Calculated from $\frac{t}{r}$ or $\frac{25.4\ T}{r}$; or $\frac{0.711\ t}{R}$; or $\frac{18.06\ T}{R}$

Burst Factor: From the formulas $\frac{b}{r}$; or $\frac{70.3\ B}{r}$; or $\frac{50\ B}{R}$.

Breaking Length: In meters, calculated from the formula $\frac{200{,}000}{3r}\ p$; or $\frac{30{,}240}{r}\ P$; or $\frac{47{,}400}{R}\ p$; or $\frac{21{,}500}{R}\ P$.

Stretch: As percentage.

Tear Factor: From the formula $\frac{100\ e}{r}$ or $\frac{71.1\ e}{R}$.

Precision

The average basis weight of the test sheets shall be 57-63 grams per sq. m. (equivalent to 40.5—44.8 pounds, 25 x 40-500 basis). On a complete duplicate test, the burst factor should check within 2 per cent or less, depending on the precision of the burst instrument.

In tests on a given shipment by different laboratories, if the paper testing instruments are standardized, the following maximum differences would be expected; Burst Factor, 5 per cent; Breaking Length, 7 per cent; Tear Factor, 10 per cent; Bulk, 5 per cent. These are about the same as for paper testing.

Appendix A

Specifications of Apparatus

DISINTEGRATOR

The disintegrator, illustrated in Fig. 2, consists of a removable container, A, and brass propeller and phosphor-bronze shaft, B, driven at 3000 r.p.m. by a leather belt from an electric motor.

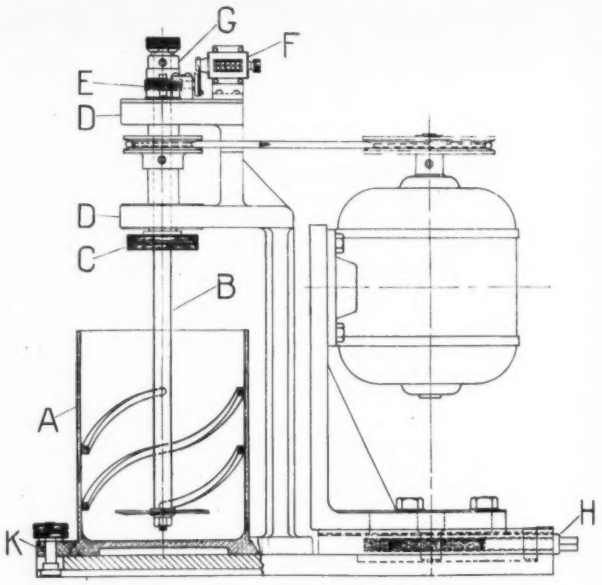

FIG. 2
Disintegrator.

The inside dimensions of the container are 6 in. in diameter by 7.5 in. high, and the inside is provided with four spiral baffles made of ¼-in. square copper rod with rounded ends. The center of the ⅛-in. radiused end of each baffle commences 1.25 in. from the bottom and ends 2.25 in. from the top, having gone exactly halfway round the circumference. The edges of the baffles are rounded with a 1/64-in. radius. Round the bottom of the container is a fillet with a ½-in. radius. The outside edge of the container base is beveled and when in position fits into two beveled lugs fixed on the base of the disintegrator. It is secured by a third lug in the form of a sliding clamp, K. A pin in the side of the base prevents rotation.

The propeller is 9 cm. (3.55 in.) in diameter and is built up of three 1.6-mm. (1/16-in.) thick, hard brass blades set at 120 degrees apart and sweated into milled slots in a hub. The hub is fitted to the end of the propeller shaft by means of a standard conical seating, nut and washer. The blades are sloped 2 degrees upwards from the horizontal and thus arranged to throw the stock downwards. The dimension of each blade is 18.2 mm. (0.72 in.) wide at its junction with the hub, and 22.5 mm. (0.89 in.) wide just before the edges of the tip are radiused 4.0 mm. (0.16 in.). The edges around the blade are rounded to a 1/32-in. radius.

The shaft B is arranged to slide up out of the way of the container by loosening the collet chuck, C, which grips the shaft to the driven pulley. The driven pulley is mounted on a hollow shaft which runs in ball bearings in the housings, D, and at the upper end of the shaft is a worm wheel, E, fixed to the shaft by means of a grub screw, and geared to the revolution counter, F, by a 25:1 worm wheel. The thickness of the spacer washer, G, is such that when the propeller is pushed right down, the bottom edges of the blades are 1 inch from the bottom of the container. The upper portion of the clamp K is made 1 inch wide and may conveniently be used for checking this height.

The tension of the round leather driving belt is adjusted by means of the screw at H, which moves the motor support.

The ¼-h.p. motor may be arranged for either a.c., or d.c., the former being preferable as the drop in speed when the propeller is immersed in the stock is only about 1 per cent, whereas with a d.c. motor the drop may be as much as 8 per cent. The speed of the propeller may be altered appreciably by means of the belt tension. Take care to check the speed if the belt is replaced by a new one, as a variation in the diameter of the belt also affects the propeller speed.

Keep the worm wheel and eccentric for the counter arm greased, otherwise the counter arm is liable to wear and after a time the counter ceases to function correctly. If wear takes place, the trouble can be remedied by loosening the clamping screw on the boss of the arm and resetting it.

Take care not to bend the propeller blades when removing the propeller from the shaft. It is best detached by fitting the jaws of an adjustable spanner over the hub and tapping the top of the spanner.

A propeller gage, furnished with the disintegrator, is used to check the blades if they are suspected of being bent.

Note: The vital parts of the above specification are (a) details of the container; (b) propellor design and position; and (c) propeller speed.

Sheet Machine

The complete sheet machine is illustrated in Fig. 3. The main parts of the machine consist of a base, B, connected by a drainage pipe, P, and cock, G, to the sump; a wire-covered grid plate, C, on which the sheet is formed, and which rests in the top of the base; and a cylindrical container, A, which is preferably provided with a hinge and which fits over the plate and the base.

The outer trough for overflow water is connected to the sump by means of two brass drain pipes, J. Around the top of the funnel of the base is machined a recess on which the grid plate rests. In the new hinged model an air vent is cut in this recess which is closed by the rubber gasket in the base of the cylinder when in position. The inside of the funnel is carefully machined and a removable 4-fin baffle, L, made of 1/16-in. brass sheet, rests in it. The function of the baffle is to prevent any possible swirling, the horizontal disk being placed over the drainage pipe to distribute the suction uniformly over the grid plate.

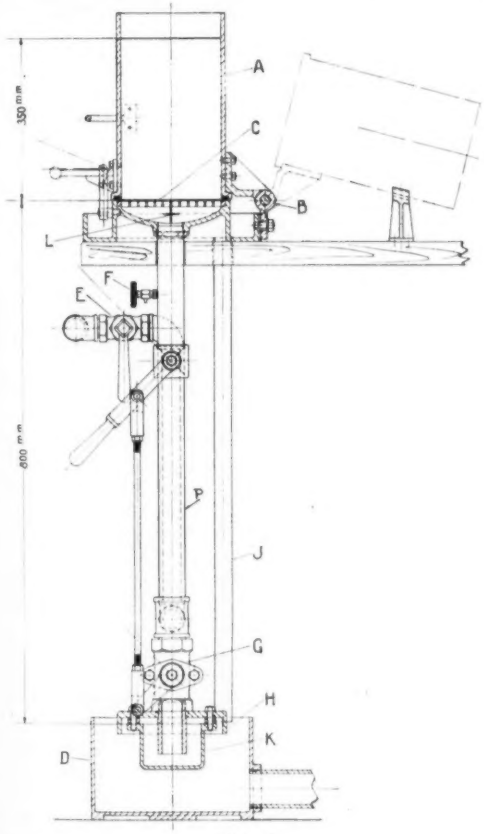

FIG. 3
Sheet Machine.

The grid plate, which is 6 13/16 in. in diameter and 23/64 in. thick, is perforated all over (except for a ¼-inch wide ring round the edge) with 3/8-in. square holes, spaced about ½ in. (0.486 in.), the ribs so formed, which are about 1/8 in. thick at the base, being tapered and then beveled to an edge 1/32 in. thick at the top, and the top corners formed by the intersection of the edges of the ribs are removed by a V cut so that, in effect, the wire laid upon it is supported by the equivalent of a ½-in. mesh wire.

The screen on which the sheet is formed is 150-mesh (diameter of wires 0.0026-0.0028 in.) and is backed by a 20-mesh screen (wire diameter 0.0148-0.0150 in.), both being stretched flat and fixed round the edge by soldering, or in the new model by means of an annular clamp ring, to the surface of the plate.

The top part of the apparatus, the container A, is 3/16 in. thick, 15.75 in. high and exactly 6.25 in. (15.88 cm.) inside diameter. A groove is cut 350 mm. (13.75 in.) from the surface of the wire. The bottom of the cylinder is stepped out to fit over the base of the instrument and carries a soft rubber ring, which makes contact round the edge of the grid plate. The cylinder is made either to lift on and off, or in the new model, is provided with a hinge and clamp, so that a watertight joint is made between the cylinder, the upper edge of the top face of the plate and the upper edge of the base.

A needle valve, F, which is desirable but not essential if the air vent is cut, is placed in the drainage tube 6 in. down from the surface of the wire. The drainage valve, G, is operated by a lever mechanism as shown in the figure.

The sump consists of a cylinder, D, with an outlet hole threaded for a 2-in. pipe either in the side as shown or in the center of the bottom if required. Three lugs are provided for screwing the sump to the floor.

A cross bar, H, carries a circular apron to prevent splashing, and bolted to the underside of the bar with distance pieces is an overflow vessel, K. The distance from the surface of this vessel to the top of the wire is adjusted to be exactly 800 mm. (31.5 in). This is the suction head on the wire.

The drainage pipe, the bore of which is actually 1 3/8 in., is connected by means of a 1¼- to 1½-in. T-piece and ½-in. elbows to the water supply valve, E.

The perforated stirrer (not shown) has a disk 6 1/8 inches in diameter, perforated with sixty 7/16-in. diameter holes. To the central rod of the stirrer, with lower edges 1 inch from the disk, are fixed four baffles 1/32 in. thick, 2¾ in. wide and 6 in. deep. These prevent swirling. All edges are carefully rounded and smoothed so as not to collect fibers when the stirrer is used.

The couch plate is of hard sheet brass, 6.75 in. in diameter by 0.020 in. thick. The couch roll (not shown) is made of brass, 4 in. in diameter with a 7 in. face, and weighs 13 kg. (28.67 pounds).

Note: Owing to the accuracy required in the construction and dimensions of the sheet machine and grid plates, it is advisable to use a machine approved by and bearing the official serial number of the Papr Makers' Association of Great Britain and Ireland. Approved machines are now being manufactured in several countries: for use in U. S. A., by the Hermann Manufacturing Company, Lancaster, Ohio; for use in Canada, through the Forest Products Laboratories, 3420 University Street, Montreal, P. Q., Canada; for use elsewhere, through the Paper Makers' Association, Shell-Mex House, Strand, London, England.

Press

A side elevation of the press is shown in Fig. 4. The cover, A, is of cast aluminum and the base, B, is of close-grained cast iron. A hard brass disk, C, 6⅞ in. in diameter, is properly bedded and fixed in the lid. The cover is provided with a handle and is held down by means of four 1-in. diameter phosphor-bronze studs and chromium-plated hard-brass wing nuts. The base is recessed to contain a heavy rubber diaphragm, D, held down round the edges by a brass annular ring with a large number of brass countersunk screws. A flat platen, E, 6 7/8 in. in diameter, is loosely fitted inside the ring to rest on the diaphragm, and the platen is prevented from coming out by 4 lugs, F, which work in 4 shaped slots round its edge. The upper and lower surfaces of the brass plates are carefully machined flat. The working fluid (glycerine) is forced under the rubber diaphragm, and the maximum distance through which the platen can rise is ⅜ in. The machined surfaces of the cast-iron base are well covered with aluminum paint to prevent rust.

Note: From the construction of the press it will be noticed that the platen is free to float on the rubber diaphragm. This ensures that an even pressure is applied over the entire surface of the pile of sheets and blotters, and in this respect is superior to plunger-type presses. The press should never be used for small pices of paper, etc., as by virtue of the feature just mentioned, if a high pressure is employed, the platen is liable to bend round the object being pressed.

Pump

The pump is shown in Fig. 5. The body is made of gunmetal and has a bore of 1.75 in. and a 4-in. stroke. The pressure is applied by means of a gunmetal plunger, D, which is actuated by a steel left-hand screw, C, through a bronze thrust washer, B, and nickeled or chromium-plated brass handwheel, A. A cup leather, F, held in position by a brass washer, and nut, G, prevents leakage. This leather washer assembly is screwed into the plunger at H and the plunger is prevented from rotating by means of a hardened steel screw, J, working in a slot, E, cut in it. Both press and pump are mounted on a heavy wooden base.

The pump is usually shipped filled with glycerine. If ever necessary to refill the pump and press with fluid, remove the gage and screw in its place the special filler cup supplied. Turn the handwheel clockwise till the plunger is farthest in, and then fill the cup with pure glycerine while the handwheel is slowly turned to draw the liquid into the body of the pump. When the pump itself is full, unscrew the filler cup and replace the gage. Loosen the screws round the annular ring, which holds down the press diaphragm, several turns with a screwdriver, and remove the 4 screws and lugs holding down the platen. Turn the handwheel to force the glycerine into the press, when the air escapes round the edges of the diaphragm, the platen being prevented from rising by hand pressure. As soon as glycerine begins to exude, wipe off the diaphragm and platen

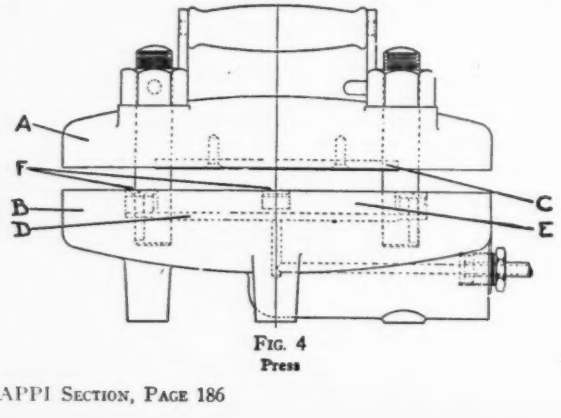

Fig. 4
Press

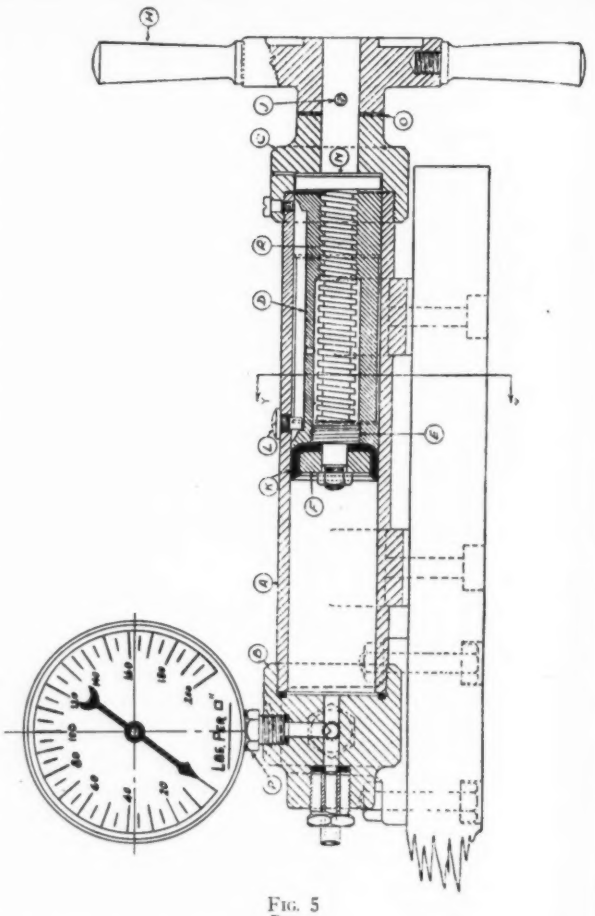

Fig. 5
Pump.

with a moist rag, replace the platen and lugs, and by tightening each screw in the annular ring in turn a small amount at a time, clamp the diaphragm in position. If the screws are not tightened uniformly, the diaphragm will not be flat, It is undesirable to tighten the screws any more than is necessary to prevent leakage. Put on the cover and screw the wing nuts hand tight. Again remove, screw in the filler cup and fill with glycerine. Turn the handwheel forward (this eliminates a few air bubbles) and then backwards, until it comes to the stop, meanwhile keeping the filler cup supplied with glycerine.

Withdraw the filler cup and replace the pressure gage. Remove the press cover and turn the handwheel forward to its farthest extent. If the platen is felt to touch the lugs before the handwheel is fully screwed in, remove the gage temporarily and turn the handwheel fully home so as to express the superfluous glycerine.

Note: The above press and pump specifications are not vital, provided that the apparatus used is capable of providing a uniformly distributed pressure of the same magnitude. This is equivalent to an actual pressure of about 60 lbs. per sq. in. on the test sheets. A template for centering the stack of sheets in the press is necessary.

Press Template

The press template for centering the sheets (not shown) is of aluminum. The guide slots fit over any two adjacent studs in the press, and when in position, the semi-circle 6.25 in. in diameter, which is cut in it, is concentric with the platen of the press.

Drying Plates

The mirror-polished stainless steel or chromium-plated brass plates (not shown) are 6.25 in. in diameter and about

0.020 in. thick. They should be free from bulges or uneven edges and if any are damaged in this way and not capable of being repaired, they should be discarded. When not in use, they should be kept in a saw-slotted wooden block, suitably made to hold them.

Drying Rings

The drying rings (not shown) are made of hard brass and are arranged to fit into each other, clamping each polished plate and test sheet round the edges. The circumference of the sheet is gripped by the rubber seating and the plate pressed against this by the extended portion of the ring below. For many purposes, however, the rubber seating is unnecessary and two plates, back to back, may be placed in a single pair of drying rings, thus doubling their capacity. The air for drying circulates through eighteen ¾-in. diameter holes.

Appendix B

Determination of Drainage Time and Drainage Factor

Drainage Time

The standard drainage time may be obtained at the same time the standard sheets are formed.

The procedure is the same as for sheet making except that the finally diluted stock mixture in the cylinder should have a temperature within 5 deg. of 20 deg. C. (effected by adding some hot or cold water to the stock), and, after a preliminary stirring, the temperature of the stock is taken to the nearest 0.5 deg. C.

After the standard stirring and pause of 10 seconds, open the drain valve and note the time taken in seconds for the formation of each sheet while draining from the 350-mm. mark to the wire. The couching of the sheet follows. Mark the sheets on which the drainage times are determined (a minimum of 3 sheets) with an indelible pencil and determine their average basis weight, separately for especial accuracy, which otherwise may be taken as that of the complete set of sheets.

If the cylinder is not provided with the new hinge and clamp, the use of a seal ring is desirable for very precise work, especially for very wet beaten pulp, or pulps containing much loading material, having drainage times of upwards of 20 seconds. The method of using the seal ring is described in detail in Tech. Assn. Papers, Series XV, p. 197 (June, 1932) or *Paper Trade Jour.* March 24, 1932, p. 40.

Note: Water from a high-pressure main is sometimes aerated. In such case it should be allowed to become degassed in an open container before pouring into the cylinder, as the presence of air bubbles in the drainage pipe may slow the drainage time appreciably.

Cleaning of Grid Plate and Calibration

The spare grid plate supplied with the apparatus should be used to check the cleanliness of the grid plate in use, using some slow stock, and if the drainage time with the new plate is reduced, the grid plate in use should be cleaned by a steam jet, by scouring with weak acid after a weak alkali wash, or by quickly dipping the plate in conc. sulphuric acid, followed by prompt washing in water. This check should be made at least weekly if the stock contains sizing and filler material. The conc. acid is effective in dissolving or removing any cellulosic material.

The wire may also be cleaned in certain cases by inverting the plate over a Bunsen burner and carefully burning out the dirt. With this treatment, the wires will bulge out and care is necessary not to burn the fine wire. When the plate is cooled, the wires will return to their normal tautness and a very weak acid wash will complete the process. If none of these treatments is effective, the spare grid plate should be put into use and the old plate returned to the manufacturer for recovering.

With pure water at 20 deg. C. the drainage time with the clean grid plate in position should be 3.5 seconds. If over 4.0 seconds, and the wire is clean, it is an indication that the drain valve is either dirty or else through wear its effective opening has become reduced, in which case the plug is easily removed and the hole suitably enlarged with a file.

Calculation

If d is the average drainage time obtained in seconds; t deg. C. the average temperature of the mixture in the cylinder; and T the average basis weight (grams per sq. m. oven-dry) of the resulting sheets; then the standard drainage time in seconds for the standard conditions of 20 deg. C. and 60 grams per sq. m. (dry basis) is approximately:

$$\frac{d(60-K)}{r-K}+\left(\frac{1}{Vt}-1\right)(d-4)$$

in this formula, K is a constant for a given type of pulp, usually about 25, the exact figure for which is preferably determined by experiment; and V_t is 100 times the viscosity of water in C. G. S. units at temperature t.

To facilitate calculation, the following table gives the values of $(1/V_t\text{-}1)$ for different temperatures:

Temperature Deg. C.	$\frac{1}{V_t}-1$	Temperature Deg. C.	$\frac{1}{V_t}-1$	Temperature Deg. C.	$\frac{1}{V_t}-1$
5	—0.34	16	—0.10	27	+0.18
6	— .32	17	— .07	28	+ .20
7	— .30	18	— .05	29	+ .23
8	— .28	19	— .02	30	+ .25
9	— .25	20	0.00	31	+ .28
10	— .23	21	+ .02	32	+ .31
11	— .21	22	+ .05	33	+ .33
12	— .19	23	+ .07	34	+ .36
13	— .16	24	+ .10	35	+ .39
14	— .14	25	+ .12		
15	— .12	26	+ .15		

The above formula was worked out empirically by J. d'A. Clark, after a large number of observations, and gives more accurate results than the previous formulae which greatly over-emphasized the temperature-correction effect for low drainage times.

Drainage Factor

The drainage-time determination is not well suited for very free pulp. An excellent method of determining the slowness of pulps especially of free stock has been described by W. Boyd Campbell *(1)*.

A sufficient volume of the stock is added to the sheet machine to obtain a drainage time of preferably 10-15 seconds, and subsequently an additional and sufficient volume to give a drainage time of a much longer period, preferably 40-60 seconds.

The amount of stock lost through the wire is almost exactly the same quantity in both cases, so the difference between the oven-dry weights of the sheets formed at the long and short periods quite accurately corresponds to the increment of stock for a determined increase in the drainage time.

The drainage factor, calculated in seconds per dry gram of pulp at 20 deg. C. is given by:

$$\left[\frac{D+\left(\frac{1}{Vt_1}-1\right)(D\text{-}4)\right]-\left[d+\left(\frac{1}{Vt_2}-1\right)(d\text{-}4)}{W-w}\right]$$

In the formula D is the observed drainage time in seconds for a sheet weighing W grams to form at temperature t_1 and d is the observed drainage time in seconds for a sheet weighing w grams to form at temperature t_2, the factors $(1/V_{t1}—1)$ and $(1/V_{t2}—1)$ being taken from the preceding table of values.

The method is suited for accurately determining the freeness of any class of stock, beaten or unbeaten, and is not appreciably influenced by the cleanliness of the wire, the size of mesh, the construction of the grid plate, or

details of the drainage system, provided the initial effective head on the stock is 1350 mm. and the final head 800 mm.

Appendix C
Testing of Board Stock

Pulp suitable for board manufacture is as a rule relatively weak and relatively free, and often contains quantities of shives; consequently, it is suggested to use 150 grams per sq. m. as a standard basis weight for testing this class of stock, employing 1000 cc. of stock at 0.3 per cent consistency for each sheet and determining the drainage corrected to 150 g. per sq. m. and 20 deg. C. Four pieces of blotter are employed for couching in place of the two required, and two dry blotters in place of the single blotter normally required in both first and second pressings, the rest of the procedure for disintegrating and testing remaining the same as for paper-making stock.

Appendix D
Modification for Routine Control Work

A very speedy and simple method of using this apparatus, suited for groundwood mill control, has been described by Clark *(2)* in which the freeness (drainage time) and the strength of the pulp may be obtained in about 15 minutes by use of this apparatus.

It is clear that between this rapid method and the complete standard method, a suitable routine method can be devised to meet any required conditions. Where substantially unbeaten stocks are being tested, the double pressing may be dispensed with and the sheets given a single pressing for 5 minutes at 50 lbs. per sq. in. gage pressure, without using the plates, then separated from the blotters and dried in a current of air in the humidity room for testing. Some of the results will be nearly the same as with the standard method, because the gain in strength due to shrinkage in this case is nearly equal to the loss of strength occasioned by the omission of the second pressing. An allowance will have to be made for the decreased diameter of sheets made in this manner for the basis weight determination.

If departures are made from the standard method as described or different apparatus is used, it is recommended that conversion factors be obtained for the type of pulp being tested and with their aid the results approximated to standard.

An excellent method of drying and conditioning the sheets has been developed by the Forest Products Laboratories of Canada which shortens the time required for both to less than an hour, while still conforming to the standard procedure. The apparatus consists of a closed box provided with one or more 6-inch wide vertical slots in its sides inside and against which the drying rings are stacked. An electric fan exhausts air from the box through a suitable opening, the air passing in through the holes in the drying rings and over the sheets. The whole apparatus is kept in the constant humidity room.

Note: If a fan is used to blow air into the box, the fan motor becoming heated and in the path of the air, the relative humidity of the air passing over the sheets may be appreciably lower than that of the air in the room.

Alternatively, in a constant humidity room it is sometimes more convenient to lead part of the conditioned air to a slotted duct on one of the walls, the duct having slides and clamps to hold the rings. The conditioned air is thus blown through the rings and over the sheets and dries and conditions them effectively. This obviates the need for an additional fan and makes a particularly neat piece of equipment.

Another modification for obtaining results quickly, including a very good design for a rapid air drier has been described by Bradshaw *(3)*.

Additional Information

The above apparatus and methods are practically identical with the standard method adopted by the Paper Makers' Association of Great Britain and Ireland and by the Technical Section of the Canadian Pulp and Paper Association. For further particulars of the original method, together with very complete experimental data, reference is made to the "Interim Report of the Pulp Evaluation Committee to the Technical Section of the Paper Makers' Association," Vol. 1[3].

At the Annual Meeting of the Canadian Pulp and Paper Association in 1931 was published the result of an investigation *(4)* into the method by the Forest Products Laboratories of Canada, employing free and slow groundwood, sulphite, kraft and soda pulps. A close relationship between the resulting strength of the pulps and those obtained by the Canadian method then existing, a slightly modified Genberg-Laymon method, was indicated with reproducibility in favor of the British apparatus and method. A further report *(5)* of comparative tests on several sheet-making machines and methods, presented at the annual meeting in 1932 definitely confirmed the superiority of the method described. A concurrent independent investigation by Laymon *(6)* between the Genberg-Laymon method (previous TAPPI method) and this method gave similar indications. Some experimental conversion ratios for the two methods are also given in that paper. An independent investigation *(7)* by the Forest Products Laboratory in Madison in 1933 has also confirmed the superiority of this method. Reference is also made to a discussion of the differences between the two methods at the 1930 fall TAPPI meeting in Erie, Pa., when the apparatus was first demonstrated in this country.

A very informative paper by Harrison *(8)* contains much experimental data on the operation of this apparatus and method with pulps beaten in a Lampen mill.

A companion method and of equal precision for evaluating the beating characteristics of pulps, using a laboratory kollergang, is described in detail by Clark *(9)*, *(10)*.

[3] Obtainable from the Secretary of TAPPI—Price $4. Vol. II will be published before 1937.

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Strike Container Shares from Listing

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1936—The Securities and Exchange Commission has announced that it has granted the application filed by the New York Stock Exchange to strike from listing and registration 367,930 shares of Class A common stock, $20 par value of the Container Corporation of America and 567,752 shares of Class B common stock, no par value which became effective at the close of the trading session on August 29.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Sizing

Suitability of Sweet-Potato Starch for Beater Sizing of Paper. C. G. Weber, M. B. Shaw and M. J. O'Leary. U. S. Bur. Stand. Misc. Publ. M150. 7 p. June, 1935.—The relative effects of maize, cassava and sweet-potato starches on both the retention of starch and clay and the properties of sulphite-soda, rag-sulphite, and all-rag book papers were investigated. In all papers the presence of starch improved the bursting strength and in the first two kinds it improved the clay retention. In sulphite-soda it materially increased, but in rag-sulphite slightly decreased, the resistance to air permeability. In all cases starch reduced the tear opacity. Papers containing sweet potato starch were as strong as the best papers containing the other starches, but generally showed superior starch and clay retention and in some cases superior resistance to air permeability, which was assumed to be a measure of the extent to which the paper was "closed up." Accelerated aging of sulphite-soda paper showed equal stability with all starches.—A.P.-C.

Sizing Paper. Judson A. DeCew. Can. pat. 352,422 (Aug. 20, 1935).—Ammonium resinate and alumina are made to react to produce in paper stock an alkaline precipitate consisting of hydrate of alumina and resin hydrate. After drying, the alkalinity disappears, whereupon the treated paper becomes neutral and sized. *E. g.,* 1000 lb. of fiber (dry weight) is mixed in a beater with 20,000 lb. of water; to this are added 300 lb. of alkaline filler such as calcium carbonate, 15 lb. of ammonium resinate (dry weight) in the form of an aqueous solution containing 500 lb. of water, and 15 lb. of alum. Theoretically there is formed 3.5 lb. of precipitated alumina. Instead of being added to the beater, the alum solution may first be neutralized with ammonia or other alkali, and the precipitated alumina added to the beater with the size. The hydrated alumina will combine in the beater with the ammonium resinate to form a compound which coats the fiber and which will size the paper when the pulp is dried.—A.P.-C.

Sizing Paper. Laboratoire Egé. Fr. pats. 782,068, and 782,069 (May 27, 1935).—*No. 782,068*—A very fine homogeneous powder containing resin, a basic salt such as anhydrous sodium carbonate, and, if required, a protective colloid such as casein, gelatin or starch, are used. *No. 782,069*—A resinous product for sizing paper is obtained by subjecting resin without a protective colloid to a grinding in a solution containing caustic soda or ammonia. —A.P.-C.

Waterproofing Composition Suitable for Use in Sizing Paper. Thomas Hans and Charles E. Raney, assignors to J. P. Brunt. U. S. pat. 2,015,796 (Oct. 1, 1935). —About 300 parts of comminuted cumar resin having a melting-point of about 110 deg. to 115 deg. C. is stirred into a mixture formed of 285 to 290 parts of water, 12 to 16 parts of sodium silicate and 9 to 10 parts of oleic acid, while maintaining the liquid at a temperature of about 32 deg. to 70 deg. C.—A.P.-C.

Paper Sizing. Louis L. Larson, assignor to E. I. du Pont de Nemours and Co. U. S. pat. 2,022,004 (Nov. 26, 1935).—The degree of sizing is increased by adding to the pulp in the beater, or by applying to the surface of the paper (with a size press or at the calenders), a water emulsion of a polyhydric alcohol-polybasic acid resin, the resin having an acid number of 25 to 64 and containing in combined form from 65 per cent to about 90 per cent by weight of a polyhydric alcohol ester of an aliphatic monocarboxylic acid containing not less than 16 carbon atoms (*e.g.,* resin obtained by interaction of suitable proportions of glycerine, stearic acid and phthalic anhydride). —A. P.-C.

Sizing Paper Containing an Alkaline Filler. Harold R. Rafton, assignor to Raffold Process Corp. U. S. pat. 2,020,328 (Nov. 12, 1935).—Paper containing an alkaline filler is sized by applying paraffin (either as an aqueous emulsion or dissolved in an organic solvent) at any suitable point (wet or dry end) of the paper machine, or to the finished paper after it has left the paper machine.—A.P.-C.

Manufacture of Sized Papers. George A. Richter, assignor to Brown Co. U. S. pat. 2,018,875 (Oct. 29, 1935). —Printing or writing paper is sized by passing the waterleaf sheet through a 1 to 5 per cent viscose solution, regenerating the cellulose from the viscose either by drying at high temperature or by treatment with acid or with acid salts, and finally treating with a 6 to 8 per cent glue solution, with or without addition of alum or other glue-tanning agent.—A.P.-C.

Paper Making. William P. McCorkindale, assignor to The McCorkindale Co. U. S. pat. 2,021,125 Nov. 12, 1935).—In the production of imitation hand-made paper by the method and apparatus described in McCorkindale's U. S. pat. 2,009,184 of July 23, 1935, a suitable sizing material is applied to the sheet of paper as it is carried by the carrier which transfers it from the forming member to the drier.—A. P.-C.

Dyes

Sulphur Dyestuffs in Paper Making. Maurice Déribéré. Papeterie 57:870-874 (Oct. 10, 1935).—A brief outline of the preparation of sulphur dyestuffs and of the manner of using them in the coloring of paper.—A. P.-C.

Fluorescence of Colored Papers. Maurice Déribéré. Papier 38:797-800 (Sept., 1935).—A table is given showing the fluorescence of a number of commercial dyestuffs on paper (bleached and unbleached sulphite, with or without admixture of groundwood) when exposed to a mercury arc lamp. The results show that the fluorescence of the various dyes are not as bright when fixed on paper as on other usual fibers (rayon, cotton, wool, silk), that interesting distinctions can be made in the case of yellow, orange and red papers, but not with the other colors, and that dyestuffs in mixtures can be identified in spite of the fact that they frequently are partially masked by one another. —A. P.-C.

Adhesives

Can the Coated Paper Industry Advantageously Replace Casein By Other Adhesives? Fritz Hoyer. Gelatine, Leim, Klebstoffe 3:174-176 (1935); C. A. 30:859.—The German casein industry is not in position to meet the

demands of the coated paper industry. Of the possible substitutes starch can be obtained domestically but it has disadvantages (lack of water resistance and difficulties in operating technic) that limit its use. Animal glues have been used but the domestic industry is not self-supporting. —C. J. W.

Starch and Dextrin Adhesives. Fred Holt, Jr. Paper Industry 17:482-485 (Oct., 1935).—A brief outline of the history and chemistry of starch and dextrin, of the manufacture and analysis of starch and of its use in the paper industry.—A. P.-C.

Casein Glues. Fred Holt, Jr. Paper Industry 17: 656-658 (Dec., 1935).—A brief review of the chemistry and manufacture of casein, of the production, properties and testing of casein glues, and of their applications in the paper industry.—A. P.-C.

Adhesive or Binder for Sand Paper. Richard P. Carlton assignor to Minnesota Mining and Manufacturing Co. U. S. pat. 2,030,743 (Feb. 11, 1936).—An adhesive suitable for binding abrasive particles to paper is composed of a solution of a cellulose compound, a gum (natural or synthetic), gum camphor, and oil (suitably castor oil). —A. P.-C.

Process and Device for the Pasting of Paper and Other Webs of Stock. Johann Kern & Julius Heinrich, Steyrermuhl. Aust. pat. 141,050 (Nov. 15, 1934).—J. F. O.

Analysis and Testing

The Application of the Modified One-Step Process as a General Method of Determination of Cellulose. Naturwissenschaften 23:577 (1935); C. A. 30:853.—The "one-step" method was modified and shortened; a 1.5 per cent chlorine dioxide solution and 1 to 1.5 per cent pyridine solution are now used. The phloroglucinol reaction disappears some time before the destruction is finished. —C. J. W.

Methods of Testing Cellulose. R. Gabillon. Rev. Chim. Ind. (Paris) 44, 310-315, 330-334 (Nov., Dec., 1935).—A brief description and discussion of the principal tests applied to cellulose, particularly that used in chemical industries: moisture, ash, fat, chlorine and chlorides, sulphuric acid insoluble, color, hydrophilic properties, alpha-cellulose, copper number, furfural number, iodine number, silver number, caustic potash solubility, methylene blue number, and cuprammonium viscosity.—A. P.-C.

The Determination of the Viscosity of Cellulose Solutions, its Technical Procedure and its Importance to the Commercial Process. D. Kruger. Zellstoff-Faser 32, No. 8: 113-20 (Aug., 1935).—By means of numerous references throughout the literature; the author discusses the following, viscosity determination as a means of evaluating cellulose materials, viscosity determinations of cellulose solutions to check the important stages in the technical preparation of cellulose, artificial silk and cellulose derivatives, methods for the determination of the viscosity of cellulose solutions, and the relations between the viscosity and the other technical properties of cellulose and cellulose products.—J. F. O.

Rapid Method for Determining the Cuprammonium Viscosity of Cellulosic Raw Material. K. Fabel. Kunstseide 18, No. 1:5-7 (Jan., 1936).—A modification of the Ost method is described which requires only 20 minutes to one hour and is of sufficient accuracy for practical purposes. It is suitable for the range of low and medium viscosities. The material to be tested is dissolved by shaking in a cuprammonium solution of definite composition and is immediately measured in an Ostwald viscometer. Since the entire procedure requires only a comparatively short time, the careful exclusion of oxygen is not considered necessary except for the storing and withdrawal of the cuprammonium solution. A correction factor is given for converting the result into Ost viscosity degrees.—C. J. W.

Determination of the Percentage of Water in Wood, Textile, Etc. Paul Rother and Georg Grau. U. S. pat. 2,017,376 (Oct. 15, 1935).—A suitable hole is drilled into the material. The hole is connected to as small a vessel as possible containing an indicating device, or preferably the indicating device is constructed like a probe so that it can be introduced directly into the cavity. Cobalt compounds with salts of other metal salts shading the tint (*e.g.*, cobalt chloride and potassium) are used as moisture indicator, the color of the mixture depending on the moisture content of the surrounding air, which in turn is controlled by that of the material being tested.—A. P.-C.

Report of the Committee on Physical and Chemical Standards of the Canadian Technical Section. C. A. Sankey et al. Pulp Paper Mag. Can. 37:106-110 (Conv. No., 1936).—A progress report to which there is appended a brief summary of recent developments in the field of standards considered of interest to the pulp and paper industry, with bibliography of 135 references.—A. P.-C.

Developments in Paper Testing During 1935. B. W. Scribner. Paper Trade J. 102, No. 5:43-44 (Jan. 30, 1936).—A brief outline of the more important developments in paper testing published in 1935, with bibliography of 69 references.—A. P.-C.

Progress in the Testing of Pulp and Paper During the Year 1934. Korn. Zellstoff u. Papier 15, No. 9:353-56 (Sept., 1935).—The following topics are briefly reviewed; the use of the fluorescent microscope in fiber determination, other methods for fiber determination, use of polarized light for determining genuine parchment paper, proof for animal sizing, starch determination in paper, smoothness testers for paper, copper number, degree of cooking, standardized methods for testing the strength of pulps, absorption of pulps, and method for determining the fiber length.—J. F. O.

Multi-Stage Freeness Control in Newsprint Production. C. O. Bachman. Paper Industry 17:649-651 (Dec., 1935).—A brief discussion explaining the advantages of multi-stage freeness control (use of the time-drainage curve) and the possibility of obtaining by its means very close control of paper-machine stock quality. —A. P.-C.

Apparatus for Determining the Concentration of Paper Pulp. T. M. Titov. Russian patent 34, 197 (Jan. 31, 1934).—The concentration of the paper pulp is measured by means of a helical stirring device rotating in a cylindrical container with the pulp and recording the load of an electric motor rotating at constant speed.—C. J. W.

Testing for Ground Wood Pulp. Klemm. Wochbl Papierfabr. 66, no. 44:828-29 (Nov. 2, 1935); Papierfabr. 23, No. 44: 366-67 (Nov. 3, 1935). Methods for the determination of ground wood in papers of various fiber composition.—J. F. O.

Method for the Determination of Wood Pulp. Unbleached Chemical Pulp and Bleached Chemical Pulp Fibers in Paper and in Pulp. B. K. Mukhopadhyay and K. K. Tampy. Analyst 60:529-531 (1935).—The method described is for the estimation of groundwood, bleached chemical pulp and unbleached chemical pulp when all three are present, as in cheap news print and wrapping papers. By combining the results of counts carried out as in Cross and Bevan's method, using the two stains separately, a formula is worked out which gives the content of each of the three classes within the permissible experimental error.—A. P.-C.

Wood Pulp Analyses. S. Samuelsen and O. Bade.

Papir-J. 23, No. 22:241-243 (Dec. 16, 1935).—The authors compare a number of empirical pulp testing methods used at the Norwegian research institute with the British standard method and point out the discrepancies in some of them. A plea is made for the international adoption of uniform methods and apparatus in the testing laboratories.—C. J. W.

Pulp Tester. Alfred Schopper. U. S. pat. 2,022,010 (Nov. 26, 1935).—In a freeness tester the valve is connected with a lifting device which is started in any suitable manner and then acts automatically so as to eliminate the personal factor in the opening of the valve.—A. P.-C.

Porosity Tester. Rudolf Schopper. U. S. pat. 2,021,948 (Nov. 26, 1935).—In a porosity tester in which the suction of air through the sample is produced by means of a Mariotte flask, the flask is mounted stationarily on a fixed frame, and the discharge end of the outlet pipe is mounted so that its level can be varied as desired. In carrying out a test the level of the outlet pipe is adjusted to obtain a rate of flow equal to that with a paper of known permeability or porosity, and the hydrostatic head at which this is obtained, as compared with the head used for the paper taken as standard, gives a measure of the porosity of the sample as compared to that of the standard. —A. P.-C.

Smoothness Tester. Ralph A. Masten, assignor to International Paper Co. U. S. pat. 2,019,541 (Nov. 5, 1935).—The invention provides an instrument for measuring the smoothness of paper by determining the time required for a known quantiity of air under known pressure to escape between a smooth true plane of standard dimensions and a sample piece. It permits of determining this property for each side of the same sheet separately and simultaneously.—A. P.-C.

The Determination of Water Vapor Permeability of Cellulose Wrapping Materials. W. H. Charch and A. G. Scroggie. Paper Trade J. 101, No. 14:31-39 (Oct. 3, 1935.—A detailed description is given of a test that has been found satisfactory for determining the permeability to water vapor of the most highly moistureproof wrappers, such as moistureproof cellophane. It is based on the exposure of a small dish containing water and sealed tightly with the membrane to be tested, to a practically dry atmosphere for a period of 24 to 30 hours at a constant temperature. The dish is weighed before and after this exposure and the loss in weight is calculated to a standard basis for comparison. It is suggested that the method gives even more accurate results when used with wrappers exhibiting a high rate of moisture transmission. The factors influencing its accuracy are discussed, and a special thermostat is described which has a capacity for over 500 test dishes, will hold a given temperature constant within ±0.2 deg. C. at any one point and will maintain an atmosphere of less than 2 per cent relative humidity over periods of days.—A. P.-C.

The Tarnishing of Gilt Inks of the Bronze Powder Type When in Contact with Paper. O. J. Schierholtz. Pulp Paper Can. 36:609-613 (Nov., 1935).—Acidity in paper originating in the hydrolysis of paper makers' alum is shown to be a primary cause of the tarnishing of gilt gums which are frequently used to decorate wallpapers, etc. Treatment of the paper, prior to gilding, with a solution of alkaline-earth bicarbonates prevents tarnishing due to alum or other tarnish-producing constituents normally present in commercial papers. An effective alternative method is to apply an alkaline-earth hydroxide solution followed immediately by a solution of carbon dioxide gas in water. During tarnishing of gilt papers a gas (very probably sulphur dioxide) is produced which itself has a tarnishing effect on gilt. Comparatively few types of commercial papers are free from tarnish-producing ingredients. The tarnishing of gilt gum is an extremely delicate test for sulphur dioxide, being much more sensitive than the usual qualitative reagents.—A. P.-C.

Some Observations on Burst, Tensile and Stretch Tests. James d'A. Clark Paper Trade J. 102, No. 2: 40-42 (Jan. 9, 1935).—The existing TAPPI methods for bursting and tensile strength are considered to be inadequate for precise purposes, notably for pulp testing, and possibly for use in cases of disputes of paper quality. In the proposed method for bursting strength, pressure should be applied at such a rate that the paper will burst within 0.2 sec. of one-thirtieth of the bursting pressure, with a minimum time of 2.0 ± 0.2 sec.; in the proposed method for tensile strength, the strip must be 180 mm. by 15 mm. and the time of break from 10 to 30 sec., preferably as near to 20 sec. as possible. Comparative data obtained by the present and proposed methods are presented and discussed.—A. P.-C.

Studies of Tensile and Bursting Tests. Roger C. Griffin and Russell W. McKinley. Paper Trade J. 102, No. 2:34-35 (Jan. 9, 1935); compare preceding abstract.—Comparative data obtained by the existing TAPPI methods for tensile and bursting tests and by the modifications thereof proposed by Clark are presented and discussed. It is concluded that the proposed modifications give more consistent results and would seem advisable for precise work, but for most purposes the existing methods ensure sufficiently reliable results.—A. P.-C.

Contribution to the Study of the Fluorescence of Paper Pulps. Maurice Déribéré. Papier 39:987-989 (Nov., 1935).—The reflection of a number of bleached and unbleached pulps were measured under ordinary and under filtered ultra-violet lights. On the whole the reflection of the various pulps under ultra-violet light followed in the same order as under ordinary light. The fluorescence increased in brightness with the degree of reflection, so that visual examination under ultra-violet light gives a better idea of the approximate degree of reflection that visual examination under ordinary light.—A. P.-C.

New Methods for Measuring the Waterproofness or Impermeability of Paper. Maurice Déribéré. Papeterie 57:966-970 (Nov. 10, 1935).—J. Grant's method (*J. Soc. Chem. Ind.* 53:349-350T (1934)) has been modified to render it quicker for papers that exhibit high impermeability or resistance to water. The sample is placed over the top of a small jar provided with a screw top which holds the sample in place and provided with a central opening for placing the indicator on the paper. The bottom of the jar is provided with a side tube connected with a vertical graduated tube, so that by using a suitable liquid (*e.g.*, mercury in the tube and bottom of the jar and water or any desired solution in the top of the jar), the test can be carried out under a suitable hydrostatic head and thus hastened. In the case of the original Grant test, "creeping" of the water or solution over the edges of the paper can be prevented or minimized by dipping the latter over a width of 3 to 5 mm. in molten paraffin.—A. P.-C.

The Optical Characteristics of Paper. II. A Precision Opacimeter. F. A. Steele. Paper Trade J. 101, No. 17:31-35 (Oct. 24, 1935).—A description is given of the technical details of the design, construction and calibration of the instrument used for measuring paper opacity that was used for establishing the mathematical relationships in regard to the optical characteristics of paper presented in a previous paper (*Paper Trade J.* 100, No. 12, 37-42 (March 21, 1935)).—A. P.-C.

The Photochemical Reactions of Cellulose. III. The Determination of the Relative Spectral Distributions of

the Energy of the Emission Light of the Quartz Mercury Vapor Lamp. Sutezo Oguri. J. Soc. Chem. Ind. Japan 38, Supp. Binding: 392-393 (1935).—A spectrometer and a thermopile galvanometer set were used for measuring the relative intensities of the radiation. Experimental values are presented over the range of 1500 to 700 Angstrom units, and are plotted against the galvanometer deflection.—A. P.-C.

Notes on the Testing of Corrugated Cardboard. Lhomme et Argy. Pulp Paper Can. 36, 607-608 (Nov. 1935).—See *Paper Trade J.* 101, No. 20:44 (Nov. 14, 1935).—A. P.-C.

Tear Strength and Stretch. Paul Szoke & Oscar Frankel. Papier-Fabr. 33, No. 25:213-14 (June 23, 1935). —Mathematical relations of the tear strength and stretch. —J. F. O.

Committee for the Analysis of Fibrous Materials of the German Pulp and Paper Technical Association. Determination of Wood Gum and the Determination of Pentosane. Papier-Fabr. 33, No. 27:225-26 (July 7, 1935).—Details and calculations for the determination of wood gum in pulps by the sodium hydroxide method, and the same for the determination of pentosane.—J. F. O.

Standard Process for the Determination of the Whiteness of Viscose Pulp. Zellstoff u. Papier 15, No. 11: 435-36 (Nov., 1935).—Variations in the whiteness of viscose pulp leads to differences in the finished silk. With the moisture content from 5 to 16 per cent there is no effect on the whiteness of the pulp. Description of the method and tabulation of the results are given.—J. F. O.

Standardization of the Method for Determining the Whiteness of Sulphite Pulp. A. M. Katz. Bumazhnaya Prom. 14, No. 7:33-38 (1935); C. A. 30:857.—The Kondratzkii differential photometer is better suited for the determination of the whiteness of sulphite pulp than are the Ostwald and Pulfrich photometers.—C. J. W.

New instrument for testing the fastness to light. Papier-Ztg. 60, No. 81:1423-1424 (Oct. 9, 1935).—Brief description is given of the Rectron testing lamp for measuring the fastness-to-light of dyes and dyed articles. —C. J .W.

New Light Source for Short Tests and Fluorescence Analyses. W. Münzinger. Nitrocellulose 6, No. 10: 179-180 (Oct., 1935).—A new, special lamp, the so-called Ulvir lamp, has been developed, whose range includes the ultra-violet, the infra-red and the visible spectrum. It is claimed to be superior to ordinary quartz lamps and was also found suitable for fluorescence analyses.—C. J. W.

Ultra-Violet Light As An Aid in Paper Making. J. Grant. Proc. Tech. Sect. Paper Makers' Assoc. 16:97-113 (1935).—The applications of ultra-violet light in the identification of fibers, fillers, and blemishes in paper, the measurement of sizing and the examination of various types of falsification problems are discussed.—A. P.-C.

A Study of the Reflection of Filtered Ultra-Violet Light By Papers. Maurice Déribéré. Papier 38: 1083-1086 (Dec., 1935).—The reflection of a number of samples of paper was determined under ordinary light and under filtered ultra-violet light. On the whole, the reflection of ultra-violet light followed the same order as that of ordinary light, provided only papers of the same color and nature were compared.—A. P.-C.

The Permanganate Number As a Criterion of Pulp Mill Water. H. Bautzen. Zellstoff u. Papier 15, No. 11:436-38 (Nov., 1935).—The use of permanganate solution to measure the organic content of pulp mill waters is discussed. Results of waters to various mills given and in conclusion the author states that the permanganate number alone is insufficient for testing pulp mill water. —J. F. O.

The Antimony Electrode in Paper Making. Maurice Déribéré. Papeterie 57:933-41 (Oct. 25, 1935).—An explanation of the principles of the antimony electrode and of the technic of its use in the measurement of pH. —A. P.-C.

A Universal Hydrogen Ion Indicator. Donald T. Jackson and John L. Parsons. Paper Trade J. 102, No. 3:44 (Jan. 16, 1935).—The universal hydrogen ion indicator of Yamada (Japanese patent 99,664) has been found to be very useful in a pulp and paper mill over a range of pH from 4 to 10 where an accuracy of 0.5 to 1 pH unit is desirable. Comparative results with buffered and unbuffered solutions over this pH range with the universal indicator, the glass electrode and the colorimetric methods of pH determination show very good agreement.—A. P.-C.

Reagent Paper Giving the Order of Magnitude of the pH of a Solution. P. Huc. Halle Aux Cuirs 1935: 270-272 (Dec. 22).—"Genacid" reagent paper, manufactured and sold by Laboratoire Montagu, 48 Blvd. Port-Royal, Paris, when immersed in a solution, gives a color which varies with the pH of the solution, as follows: red orange 4.6, pale red orange 5, yellowish orange 5.4, light orange yellow 5.8, yellow 6.2, yellowish green 6.6, light green 7, dark green 7.4. The paper does not determine the pH accurately, but merely gives its order of magnitude, which in many cases is very useful.—A. P.-C.

Specialties

Manufacture of Fibrous Sheet Material Having a Basis of Partly Hydrolyzed Cellulose. Society for Chemical Industry in Basle. Brit. pat. 431,956 (May 14, 1934).—Especially low water-absorbent, electric insulating material is made by associating a fusible primary amine-formaldehyde resin with sheets of a cellulosic material such as paper before, after, or simultaneously with their hydrolysis (parchmentization) with the usual reagents, and then subjecting the product to high pressure and a temperature greater than the softening point of the resin. An aniline-formaldehyde resin is suitable; the fusion point of the product rises with an increase in the proportion of formaldehyde used.—A. P.-C.

Treatment of Paper. Louis Taylor. Fr. pat. 784,902. —In order to improve the absorbency and pliability of paper, a very large number of small closely-spaced holes that do not form any particular design are made in the surface of the paper. An apparatus is described.—A. P.-C.

Asbestos Paper or Cardboard. A. A. Bryushkov and A. D. Bakhtin. Russian patent 37,985 (July 31, 1934).— Low-grade asbestos is disintegrated in a mill, moistened with water, worked in a macerated state in a stamp mill for 2-3 hours, separated in a stream of water from traces of magnetite with the help of a magnetic separator, and finally passed through paper or cardboard machines.— C. J. W.

Manufacture of Felted Asbestos Sheet and Sizing of Asbestos. A. H. Stevens, assignee to Raybestos Co. Brit. pat. 433,974 (April 28, 1934).—An aqueous suspension of asbestos fibers (pH 8 to 10) is beaten with a colloidal sizing material (2 per cent of causticized starch, calculated on the dry weight of asbestos), which, being insoluble in the alkaline liquor, is completely absorbed on the fibers, and the whole is then sheeted on a paper machine.—A. P.-C.

Asphalt Paper, Its Manufacture, Properties and Applications. Fritz Hoyer. Bitumen 5:191-193, 216-220 (1935); C. A. 30:1997.—Asphalt papers are made (1) by impregnating the finished paper with bitumen by the hot process and (2) by adding an emulsion of bitumen and water in the hollander or to the wet paper in the mill. Details of these methods are discussed at length. Uses for asphalt paper are: roofing, packing or wrapping, paper sacks insulating material, etc. 22 references.—C. J. W.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING AUGUST 29, 1936

CIGARETTE PAPER

De Mauduit Paper Corp., *American Farmer,* Havre, 177 cs.; Champagne Paper Corp., *Ile de France,* Havre, 307 cs.

WALL PAPER

Tobias & Co., *Queen Mary,* Southampton, 1 cs.; S. K. Lonegren, *Drottningholm,* Gothenburg, 11 bxs.; S. K. Lonegren, *Gripsholm,* Gothenburg, 7 bxs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 3 bls., 1 cs.

NEWSPRINT

Perkins Goodwin & Co., *St. Louis,* Hamburg, 235 rolls; Jay Madden Corp., *St. Louis,* Bremen, 130 rolls; Gilman Paper Co., *Nyanza,* Port Alfred, 465 rolls; N. Y. Post, *Nyanza,* Port Alfred, 523 rolls; Perkins Goodwin & Co., *Hansa,* Hamburg, 306 rolls.

PRINTING PAPER

Premier Shipping Co., *Queen Mary,* Southampton, 4 cs.; F. L. Kramer & Co., *American Farmer,* London, 4 cs.; E. Dietzgen & Co., *Hansa,* Hamburg, 8 cs.

WRAPPING PAPER

Guaranty Trust Co., *Drottningholm,* Gothenburg, 63 bdls., 1,018 rolls; Guaranty Trust Co., *Gripsholm,* Gothenburg, 116 bls., 828 rolls; ———, *Edam,* Rotterdam, 67 bls.; ———, *Hansa,* Hamburg, 16 cs.

KRAFT PAPER

———, *Drottningholm,* Gothenburg, 150 bls., 322 rolls.

FILTER PAPER

H. Reeve Angel & Co. Inc., *American Farmer,* London, 17 cs.; H. Reeve Angel & Co. Inc., *Drottningholm,* Gothenburg, 7 cs.; C. Schleicher & Schull Co., *Hansa,* Hamburg, 6 cs.; E. H. Sargent & Co., *Gripsholm,* Gothenburg, 12 cs.

BRISTOL BOARDS

———, *American Farmer,* London, 2 sc.

BASIC PAPER

Globe Shipping Co., *St. Louis,* Bremen, 20 crates.

METAL COATED PAPER

K. Pauli Co., *Hansa,* Hamburg, 5 cs.

BARYTA COATED PAPER

Globe Shipping Co., *St. Louis,* Bremen, 11 cs., 10 crates; Globe Shipping Co., *Europa,* Bremen, 1 cs., 20 crates; ———, *Europa,* Bremen, 15 cs.

COATED PAPER

Globe Shipping Co., *St. Louis,* Bremen, 5 cs.

SURFACE COATED PAPER

Phoenix Shipping Co., *Hansa,* Hamburg, 2 cs.; C. Happel, *Hansa,* Hamburg, 21 cs.

PHOTO PAPER

Heemsoth Pinkus & Kerner, *Hansa,* Hamburg, 2 cs.

COLORED PAPER

Phoenix Shipping Co., *Edam,* Rotterdam, 63 bbls.

DECALCOMANIAS

B. F. Drakenfeld & Co., *American Importer,* Liverpool, 5 cs. (duplex).

DECALCOMANIAS

———, *Europa,* Bremen, 10 cs.

TRANSFER PAPER

Phoenix Shipping Co., *Hansa,* Hamburg, 7 cs.

TISSUE PAPER

Van Oppen & Co., *Pres. Adams,* Genoa, 5 cs.; ———, *Kinai Maru,* Kobe, 2 cs.

LITHO PAPER

B. Meiners, Inc., *City of Elwood,* Hong Kong, 20 cs.

PITH PAPER

Chase National Bank, *Eidsvold,* Keelung, 2 cs.

PAPER TUBES

———, *Hansa,* Hamburg, 76 pkgs.; ———, *Europa,* Bremen, 17 ctns.

MISCELLANEOUS PAPER

———, *Nojima Maru,* Kobe, 5 cs.; T. H. Hindle, *Eidsvold,* Yokohama, 2 cs.; The Borregaard Co. Inc., *Drottningholm,* Gothenburg, 39 bls., 115 rolls; ———, *Pres. Adams,* Genoa, 28 cs.; ———, *Kinai Maru,* Kobe, 33 cs.— Coty Processing Co., *Ile de France,* Havre, 5 cs.; A. Brown & Co., *Hansa,* Hamburg, 12 cs.; Keuffel & Esser Co., *Hansa,* Hamburg, 29 cs., 30 rolls; Jay Madden Corp., *Hansa,* Hamburg, 7 bbls.; Blauvelt Wiley Paper Manfg. Co., *Gripsholm,* Gothenburg, 48 rolls, 27 bls.

RAGS, BAGGINGS, ETC.

Jaffe Products Co., *Oriente,* Havana, 33 bls. rags; E. J. Keller Co. Inc., *Exmoor,* ———, 226 bls. rags; E. J. Keller Co. Inc., *Black Hawk,* ———, 66 bls. rags, 425 bls. flax waste, 135 bls. bagging; Philadelphia National Bank, *Black Hawk,* Antwerp, 105 bls. rags; ———, *Black Hawk,* Antwerp, 10 bls. rags; Van Oppen & Co., *Black Hawk,* Antwerp, 157 bls. bagging; Brandwien Mazur Co., *Black Hawk,* Antwerp, 158 bls. cotton waste; R. Blank, *Black Hawk,* Antwerp, 88 bls. rags; B. D. Kaplan, Co., *Laconia,* Liverpool, 6 bls. rags; ———, *Laconia,* Liverpool, 159 bls. rags; Royal Manfg. Co., *Eidsvold,* Shanghai, 100 bls. cotton waste; W. Garretson, *Eidsvold,* Shanghai, 103 bls. bagging; O. Smith & Son, *Eidsvold,* Shanghai, 100 bls. cotton waste; ———, *Eidsvold,* Kobe, 470 bls cotton waste; Chase National Bank, *Eidsvold,* Kobe, 20 bls. rags; O'Brien Padawer Co., *Eidsvold,* Kobe, 130 bls. cotton waste; G. M. Graves Co., Inc., *Transylvania,* Glasgow, 97 bls. bagging; Bank of N. Y. Trust Co., *American Farmer,* London, 25 bls. rags; ———, *American Importer,* Manchester, 100 bls. cotton waste; M. Snedeker Corp., *American Importer,* Belfast, 143 bls. paper stock; J. Levy & Son, *Siboney,* Havana, 12 bls. rags; E. J. Keller Co. Inc., *Black Heron,* ———, 48 bls. rags; E. J. Keller Co. Inc., *Pres, Adams,* ———, 190 bls. rags; Bank of Manhattan Co., *Kinai Maru,* Shanghai, 175 bls. cotton waste; ———, *Kinai Maru,* Osaka, 100 bls. cotton waste; ———, *Konig-*

stein, Antwerp, 117 bls. bagging; G. A. Henshaw & Son, *Konigstein,* Antwerp, 151 bls. flax waste; Philadelphia National Bank, *Konigstein,* Antwerp, 131 bls. rags; E. J. Keller Co. Inc., *Edam,* ———, 90 bls. rags; Chase National Bank, *Edam,* Rotterdam, 52 bls. rags; Brandwein Mazur Co., *Edam,* Rotterdam, 228 bls. cotton waste; E. J. Keller Co. Inc., *Pennland,* ———, 84 bls. bagging; E. J. Keller Co. Inc., *Konigstein,* ———, 182 bls. paper stock.

GLUE STOCK, ETC.

———, *Laconia,* Liverpool, 500 bags hide glue; ———, *Hansa,* Hamburg, 485 bags bone glue.

OLD ROPE

Manufacturers Trust Co., *Transylvania,* Glasgow, 86 coils; G. W. Millar & Co. Inc., *Black Heron,* Rotterdam, 53 coils; Chase National Bank, *Montreal City,* Bristol, 78 coils; ———, *Montreal City,* Bristol, 70 coils.

CHINA CLAY

C. T. Wilson Co., *Laconia,* Liverpool, 25 casks; English China Clays Sales Corp., *Laconia,* Liverpool, 140 bags.

CASEIN

———, *American Legion,* Buenos Ayres, 84 bags; ———, *Hansa,* Hamburg, 70 bags.

WOOD PULP

A. Giese & Son, *Edam,* Rotterdam, 20 bls. wood pulp; Bulkley Dunton & Co., *Idarwald,* ———, 4,500 bls. chemical pulp, 900 tons; Mead Sales Co. Inc., *Idarwald,* Sundsvall, 210 bls. chemical pulp, 42 tons; Castle & Overton, Inc., *Hansa,* Hamburg, 470 bls. wood pulp, 94 tons; Price & Pierce, Ltd., *Gripsholm,* Gothenburg, 125 bls. unbleached sulphite; Pagel Horton & Co. Inc., *Skagern,* Gefle, 3,330 bls. sulphate; Pagel Horton & Co. Inc., *Skagern,* Gefle, 500 bls. sulphite; Bulkley Dunton & Co., *Skagern,* ———, 125 bls. sulphite; Stora Kopparberg Corp., *Skagern,* Gefle, 265 bls. wood pulp; Price & Pierce, Ltd., *Skagern,* Ljusne, 600 bls. unbleached sulphite; Price & Pierce, Ltd., *Skagern,* Hernosand, 6,000 bls. unbleached kraft sulphate; E. M. Sergeant & Co., *Skagern,* Hernosand, 300 bls. sulphite; Central Hanover Bank Trust Co., *Skagern,* Hernosand, 600 bls. sulphite.

WOOD PULP BOARDS

H. Fuchs & Son, *Drottningholm,* Gothenburg, 169 crates; Wilkinson Grey & Co., *Drottningholm,* Gothenburg, 6 rolls; G. H. McFadden & Bro., *St. Louis,* Hamburg, 250 bls., 75 tons.

NEWARK IMPORTS

WEEK ENDING AUGUST 29, 1936

H. G. Craig Co., *Newscarrier,* Donnacona, 388 rolls newsprint; H. G. Craig Co., *Donpaco,* Donnacona, 313 rolls newsprint.

ALBANY IMPORTS

WEEK ENDING AUGUST 29, 1936

Pagel Horton & Co. Inc., *Skagern,* Sweden, 14,376 bls. wood pulp; Price & Pierce, Ltd., *Skagern,* Ljusne, 1,800 bls. unbleached kraft sulphate; Price & Pierce, Ltd., *Skagern,* Hernosand, 1,200 bls. unbleached sulphite; Bank of N. Y. Trust Co., *Skagern,* Hernosand, 3,000 bls. sulphate; ———, *Skagern,* Hernosand, 1,200 bls. sulphite; Tradesman's National Bank Trust Co., *Skagern,* Gefle, 4,000 bls. sulphate; Bulkley Dunton & Co., *Skagern,* ———, 375 bls. sulphite; Price & Pierce, Ltd., *Skagern,* Gefle, 900 bls. bleached sulphite; Stora Kopparberg Corp., *Skagern,* Gefle, 250 bls. wood pulp; Gottesman & Co. Inc., *Skagern,* Gefle, 950 bls. sulphite; Gottesman & Co. Inc., *Skagern,* Ronnebyredd, 3,014 bls. chemical pulp; Price & Pierce, Ltd., *Tungsha,* ———, 300 bls. unbleached sulphite; Bulkley Dunton & Co., *Nordness,* ———, 4,200 bls. wood pulp; Price & Pierce, Ltd., *Tungsha,* ———, 875 bls. bleached sulphite.

PORTLAND IMPORTS

WEEK ENDING AUGUST 29, 1936

J. Andersen & Co., *Idarwald,* Soderhamn, 2,000 bls. sulphate, 406 tons; J. Andersen & Co., *Idarwald,* Minksund, 3,000 bls. sulphate, 500 tons; Gottesman & Co. Inc., *Idarwald,* Hernosand, 4,500 bls. sulphate; ———, *Idarwald,* Hernosand, 1,200 bls. sulphate; J. Andersen & Co., *Idarwald,* Sundsvall, 1,800 bls. sulphate, 300 tons; Johaneson Wales & Sparre, Inc., *Idarwald,* Sundsvall, 300 bls. sulphate, 50 tons; Gottesman & Co. Inc., *Brosund,* Sweden, 625 bls. wood pulp; Price & Pierce, Ltd., *Brosund,* ———, 600 bls. unbleached sulphite; Pagel Horton & Co. Inc., *Brosund,* Sweden, 4,108 bls. wood pulp; Bulkley Dunton & Co., *Brosund,* ———, 2750 bls. wood pulp; Bulkley Dunton & Co., *Etna,* ———, 2,750 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING AUGUST 29, 1936

Stone Downer Co., *Laconia,* Liverpool, 19 cs. paper; ———, *Laconia,* Liverpool, 31 bls. thread waste, 28 bls. rags, 21 bls. paper stock; G. F. Malcolm, Inc., *Laconia,* Liverpool, 12 cs. tissue paper; ———, *Eidsvold,* Kobe, 100 bls. rags, 120 bls. cotton waste; ———, *Black Heron,* Rotterdam, 68 bls. bagging; Irving Trust Co., *Black Heron,* Rotterdam, 74 coils old rope; J. T. Lodge Co., *Black Heron,* Rotterdam, 8 bls. rags; Cordingley & Co., *Black Heron,* Antwerp, 8 bls. thread waste; Atkinson Haserick & Co., *Pres. Adams,* Genoa, 4 cs. paper; Castle & Overton, Inc., *Edam,* Rotterdam, 157 bls. wood pulp; Patterson Wylde & Co., *Edam,* Rotterdam, 88 bls. bagging; E. J. Keller Co. Inc., *Exochorda,* ———, 349 bls. paper stock.

CAMDEN IMPORTS

WEEK ENDING AUGUST 29, 1936

Johaneson Wales & Sparre, Inc., *Idarwald,* Sundsvall, 300 bls. sulphite, 500 tons.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 29, 1936

American Cotton Products Co., *Eidsvold,* Shanghai, 50 bls. cotton waste; ———, *Eidsvold,* Kobe, 200 bls. cotton waste; E. J. Keller Co. Inc., *Black Heron,* ———, 229 bls. rags; W. F. Sherwood & Son, *Black Heron,* Rotterdam, 118 bls. rags; ———, *Black Heron,* Rotterdam, 210 bls. rags; Philadelphia National Bank, *Black Heron,* Antwerp, 124 bls. rags; Guaranty Trust Co., *Black Heron,* Antwerp, 68 bls. cotton waste; Union Waste Co., *Black Heron,* Antwerp, 22 bls. rags; M. Friedman, *Black Heron,* Antwerp, 94 bls. rags; Bulkley Dunton & Co., *Idarwald,* ———, 1,000 bls. sulphate, 200 tons; Brown Bros. Harriman & Co., *Idarwald,* Hernosand, 2,453 bls. sulphate, 380 tons; Johaneson Wales & Sparre, Inc., *Idarwald,* Sundsvall, 450 bls. sulphite, 80 tons; Atterbury Bros. Inc., *Idarwald,* Sundsvall, 300 bls. wood pulp, 50 tons; Mead Sales Co. Inc., *Idarwald,* Sundsvall, 2,700 bls. sulphite, 450 tons; Perkins Goodwin & Co., *Idarwald,* Sundsvall, 519 rolls newsprint; National Pulp & Paper Co. Inc., *Idarwald,* Sundsvall, 110 rolls newsprint; Price & Pierce, Ltd., *Thalatta,* ———, 2,100 bls. unbleached sulphite; Price & Pierce, Ltd., *Thalatta,* ———, 600 bls. ground wood; Gottesman & Co. Inc., *Thalatta,* Sweden, 11,175 bls. wood pulp; E. J. Keller Co. Inc., *Maasdam,* ———, 229 bls. paper stock; E. J. Keller Co. Inc., *Tonsbergfjord,* ———, 138 bls. paper stock.

NEWPORT NEWS IMPORTS

WEEK ENDING AUGUST 29, 1936

Bulkley Dunton & Co., *Nordness,* ———, 2,214 bls. wood pulp.

(Continued on page 55)

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, September 2, 1936.

Conditions in the local paper market are considered satisfactory for the time of year. Demand for the various standard grades of paper is better than usual in this preholiday period. Sales forces of the leading paper organizations anticipate a lively Autumn. Prices are generally holding to schedule.

The newsprint paper market is exhibiting a stronger undertone. Demand from the newspaper publishers is persistent. Advertising lineage and circulations are still running ahead of last year's record. Manufacturing operations are proceeding in sufficient volume to take care of current requirements. The price situation remains unchanged.

Steadiness prevails in the fine paper market. Demand for book, cover, writing and ledger papers is holding up well. Prices continue steady. Tissues are moving in fairly good volume. The coarse paper market is displaying strength. Kraft paper specialties are moving freely. While the paper board market is quiet, an expansion of trading is looked for after Labor Day.

Mechanical Pulp

The ground wood pulp market is firmer, influenced by the recent long summer drought, which slowed production materially. At the same time, offerings of both domestic and imported mechanical pulp are fairly adequate for prevailing needs. There are no undue accumulations at the pulp mills and the statistical position of the industry is sound. Prices are steady.

Chemical Pulp

Sentiment in the chemical pulp market continues optimistic. Demand for domestic and foreign grades is fairly brisk. Bleached sulphite and kraft pulps are steady to firm, with offerings decidedly limited. Bleachable grades of unbleached sulphite are more popular than of late. Prices are maintained at formerly quoted levels, without difficulty.

Old Rope and Bagging

The old rope market is listless. Paper mill demand for domestic and imported old manila rope is restricted. Mixed strings are only moderately active. Old rope prices are practically unchanged. Offerings of scrap and gunny bagging are rather scarce and prices stronger. Some improvement transpired in the roofing bagging market, which shows signs of increased activity.

Rags

Demand for the various grades of domestic rags is better and future prospects are gradually improving. New cotton cuttings are in fairly persistent request, both for domestic and foreign account. More interest is being displayed by the felt mills in roofing rags. No radical changes are reported in the imported rag section.

Waste Paper

The paper stock market is stronger than for some time past. Board mill demand for the lower grades is improving and dealers are pleased with the outlook for the closing months of the year. Old kraft machine compressed bales are firmer and are now quoted at from 1.15 to 1.30 f.o.b. New York. The higher grades of waste paper continue steady.

Twine

While most of the business in the local twine market transacted during the past week was along routine lines, more lively trading is looked for now that the Fall season is approaching. Demand for the various varieties is light at present. There are a number of inquiries around for future needs, however, some of which should result in good-sized orders.

I. C. C. Denies Premium on Rates in South

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 2, 1936—The Interstate Commerce Commission, in a decision in connection with paper rates from the south and southwest states that "authority to establish and maintain rates on paper and paper aricles including printing and wrapping paper and pulpboard, in carloads, from points in southern and southwestern territories to Virginia, West Virginia, and Maryland gateways, to Ohio and upper Mississippi River crossings, north Atlantic ports and certain points in central territory without observing the long and short haul provisions of section 4 of the Interstate Commerce Act, denied."

IMPORTS OF PAPER AND PAPER STOCK

(Continued from page 54)

BALTIMORE IMPORTS

WEEK ENDING AUGUST 29, 1936

Bulkley Dunton & Co., *Kersten Miles,* ———, 3,250 bls. wood pulp.

GREEN BAY IMPORTS

WEEK ENDING AUGUST 29, 1936

Price & Pierce, Ltd., *Rondo,* ———, 450 bls. unbleached sulphite.

NEW ORLEANS IMPORTS

WEEK ENDING AUGUST 29, 1936

Johaneson Wales & Sparre, Inc., *Idarwald,* Obbola, 952 bls. sulphate, 136 tons; Johaneson Wales & Sparre, Inc., *Idarwald,* Sundsvall, 1,200 bls. sulphate, 200 tons; Times Publishing Co. Ltd., *Idarwald,* Sundsvall, 37 rolls newsprint; Brown Bros. Harriman & Co., *Idarwald,* Hernosand, 360 bls. sulphite, 60 tons.

HOUSTON IMPORTS

WEEK ENDING AUGUST 29, 1936

Darmstadt Scott & Courtney, *Eidsvold,* Kobe, 397 bls. bagging.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, September 2, 1936.

BLANC FIXE—The blanc fixe market is moderately active. Prices are holding to formerly quoted levels, in most instances. The pulp is quoted at $42.50 to $45 per ton, in bulk; while the powder is selling at 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Business in the bleaching powder market is about normal for the season. Contract shipments are going forward regularly. Prices continue steady and unchanged. Bleaching powder is quoted at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market continues firm. Domestic standard ground is quoted at 17½ and finely ground at 18 cents; while French and Argentine standard ground are selling at 17 and finely ground at 17½ cents per pound, in bags, car lot quantities.

CAUSTIC SODA—Paper mill demand for caustic soda is fairly active. The contract movement is well up to average. Solid caustic soda is quoted at $2.55 to $2.60; while the flake and ground are selling at $2.95 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is displaying strength. Contract shipments are moving freely. Prices remain unchanged. Imported china clay is quoted at $12.50 to $21 per ton, ship side; while domestic paper making clay is selling at $6.50 to $12 per ton, at mine.

CHLORINE—The chlorine market is exhibiting a fairly strong undertone. Shipments against contract are moving in good volume. Prices are holding to schedule without difficulty. Chlorine is quoted at $2.15 to $2.55 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is stronger. Paper making gum rosin is now quoted at $6.05 and wood rosin at $6.15 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $3.06½ per 100 pounds, in tank cars, at works.

SALT CAKE—Steadiness prevails in the salt cake market. The contract movement is fairly heavy. Prices are unchanged. Salt cake is quoted at $12 to $13; chrome salt cake at $11 to $12 per ton, at works; while imported salt cake is selling at $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is holding up well. Demand from the paper mills is fairly brisk. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—With the prices of raw materials rising, the starch market continues firm. Demand from the paper mills is fairly persistent. Special paper making starch is still quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA—Some improvement transpired in the sulphate of alumina market. Prices are holding to schedule without difficulty. Commercial grades are quoted at $1.35 to $1.60; and iron free at $2 to $2.25 per 100 pounds, in bags, at works.

SULPHUR—The sulphur market continues steady. Yearly contracts are quoted at $18 per ton, in bulk, on orders of 1,000 tons, or over, and $20 on smaller quantities. On spot and nearby car loads, the quotation is $21 per ton. All quotations are in car lots, at works.

TALC—Despite the midsummer lull the position of the talc market is practically unchanged. Prices continue steady. Domestic talc is still quoted at $16 to $18 per ton, at eastern mines; while imported talc is selling at $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
No. 1 Sulphite	7.50	@	8.50
No. 2 Sulphite	6.50	@	7.50
No. 3 Sulphite	6.00		7.00
No. 4 Sulphite	5.50		6.50

Book, B Grade, Cased			
S. & S. C.	5.85	@	6.60
S. & S. C. Litho.	6.10	@	6.85
M. F.	5.60	@	6.35
No. 4 Grade			
Coated and Enamel	6.80	@	7.65
Coated Litho	6.80	@	7.65
Tissues—Per Ream—			
White No. 1	.82½	@	—
White No. 1 M. G.	.77½	@	—
White No. 1½	.62½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.67½	@	—
Colored	.80	@	—
Kraft	.67¼	@	—
Manila	.60	@	—
Unbleached Toilet	2.60	@	3.30
Bleached Toilet	3.94	@	5.26
Paper Towels—			
Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—			
Roll, contract	41.00	@	—
Sheets	46.00	@	—
Kraft—			
No. 1 Northern	4.25	@	4.75
Standard	4.12½	@	—
Southern	4.00	@	—
Boards per ton—			
News	30.00	@	32.50
Chip	30.00	@	32.50
Sgl. Mla. Ll. Chip	47.50	@	50.00
Jute Lined Chip	47.50	@	50.00
Kraft Liners	62.50	@	65.00
White Pat. Coated	55.00	@	60.00
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	24.00	@	25.00
Dry	24.00	@	25.00

(Delivered)

No. 1 Domestic and Canadian	27.00	@	28.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.70	@	3.30
Division 2	2.65	@	2.75
Division 3	2.60	@	2.70
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.05	@	2.10
Other Than Easy Bleaching—			
Class 2. Higher than Standard	2.00	@	2.05
Class 3, Standard	1.95	@	2.00
Class 4, Lower than Standard	1.90	@	1.95

(On Dock, Atlantic Ports)

Kraft Bleached	3.00	@	3.25
Kraft Light & Strong	2.10	@	2.20
Kraft No. 1	1.85	@	2.10
Kraft No. 2	1.70	@	1.85

(F. o. b. Pulp Mill)

Kraft Domestic	1.80	@	2.00

(Delivered)

Soda Bleached	2.60	@	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.50	@	7.75
Silesias No. 1	5.50	@	5.75
New Unbleached	8.25	@	8.50
New Soft Blacks	3.75	@	4.00
Blue Overall	6.50	@	6.75
Fancy	3.00	@	3.25
Washables	2.25	@	2.50
Mixed Khaki Cuttings	3.50	@	3.75
O. D. Khaki Cuttings	4.25	@	4.50
Men's Corduroy	2.00	@	2.25
New Mixed Blacks	2.75	@	3.00

Old Rags

White, No. 1—			
Repacked	3.25	@	3.50
Miscellaneous	2.75	@	3.00
White, No. 2—			
Repacked	2.25	@	2.50
Miscellaneous	1.75	@	2.00
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00
Roofing Rags—			
No. 1	1.75	@	1.80
No. 2	1.15	@	1.25
No. 3 (bagging)	1.10	@	1.15
No. 4	1.10	@	1.15
No. 5A	.80	@	.90

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	4.50	@	5.00
Light Flannelettes	4.50	@	5.00
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.50	@	4.00
German Blue Linens	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues	2.00	@	2.25
Linsey Garments	2.15	@	2.25
Dark Cottons	1.90	@	2.10
Old Shopperies	1.75	@	2.00
New Shopperies	1.75	@	2.00
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.10	@	2.15
Domestic	1.75	@	1.85
Wool Tares, light	1.50	@	1.75
Wool Tares, heavy	1.85	@	2.05
Bright Bagging	1.70	@	1.75
Manila Rope—			
Foreign	2.40	@	2.60
Domestic	2.25	@	2.50
Mixed Strings	1.10	@	1.15
New Burlap Cut	2.75	@	3.00
Hessian Jute Threads—			
Foreign	3.00	@	3.25
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.55	@	2.65
Ordinary Hard White No. 1	2.25	@	2.35
Hard White No. 2	2.10	@	2.20
Soft White No. 1	1.95	@	2.05
Flat Stock—			
Stitchless	.65	@	.75
Over issue Mag	.65	@	.75
Solid Flat Book	.55	@	.60
Crumpled No. 1	.35	@	.40
Solid Book Ledger	1.50	@	1.65
Ledger Stock	.85	@	.90
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.75	@	1.85
New Cuttings	1.35	@	1.45
Bogus Wrapper	.40	@	.50
Old Kraft Machine-Compressed bales	1.15	@	1.30
News—			
No. 1 White News	1.15	@	1.25
Strictly Overissue	.50	@	.60
Strictly Folded	.40	@	.45
No. 1 Mixed Paper	.35	@	.40

J. Andersen & Co.

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New York

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Kraft Pulp

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KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaförden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsvikan, Sweden

Unbleached Sulphite

AKTIESELSKABET GREAKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakei
SVANÖ AKTIEBOLAG
Svanö, Sweden

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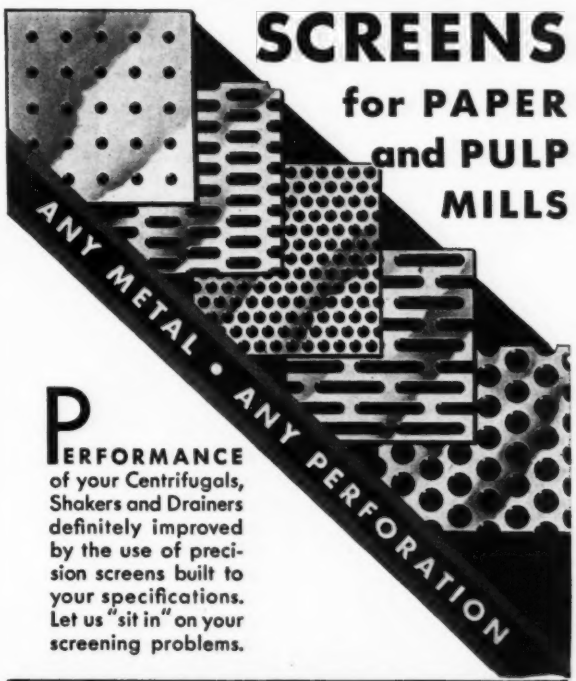

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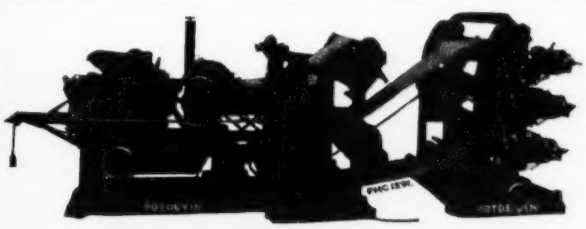

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(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.13¾	@	.15¾
Belg. White Hemp	.14¾	@	.17¾
India Compress	.13¾	@	.14¾
Fine Polished—			
Fine India	.21½	@	.23½
Special	.19½	@	.21½
Unpolished—			
Box	.12	@	.12½
Paper Makers	.09	@	.13½
Tube Rope	.10	@	.15½
Wall Paper	.11	@	.14½
Wrapping	.15½	@	.21
Special	.15	@	.15½
Soft Fiber Rope	.12½	@	.12¾
(Hard Fibre)			
Bond	.09½	@	.18
Anchor	.09	@	.10½
Manila	.21	@	.28

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¼
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.60	@	.70
Solid Books	.50	@	.60
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1 Folded News	.42½	@	.45
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.15	@	—
Coated Lithograph	6.15	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.08	@	.08½
New White, No. 2.	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft.	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.06	@	.06½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.01¾	@	.02¼
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	1.75	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed.	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	—
Repacked	2.25	@	2.50
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	1.50	@	—
Domestic No. 2	1.40	@	—
Roofing bagging	1.10	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.00	@	2.50
No. 2	.90	@	1.00
Wool Tares, heavy	3.00	@	3.25
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.20
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.40	@	1.45
No. 1 Mixed	—	@	.85
Solid Ledger Stock	1.50	@	1.60
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy	.65	@	.70
Manila Cuttings	1.80	@	1.90
Print Manila	.55	@	.60
Container Manila	.55	@	.60
Kraft Paper	1.10	@	1.20
No. 1 Mixed Paper	.45	@	.50
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.60	@	.65
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.50	8.50
No. 2 Sulphite	6.50	7.50
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	—
No. 2 Kraft	.04½	@	—
(Delivered New England points)			
Southern Kraft	.04	@	—
News Print Rolls	39.50	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.10
No. 1 Soft White	1.75	@	1.85
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.60	@	.70
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
No. 1 Old Manila	.60	@	.65
White Blank News	1.10	@	1.15
No. 1 Kraft	1.05	@	1.12½
Mixed Papers	.35	@	—
Print Manila	.55	@	.60
Container Manilas	.27½	@	—
Old Newspapers	.40	@	—
Overissue News	.50	@	—
Box Board Cuttings	—	@	.25
Corrugated Boxes	.47½	@	.50
Kraft corrugated boxes	.95	@	1.00
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.35	@	2.45
Domestic	2.25	@	—
Transmission Rope	1.20	@	1.30
Jute Rope	2.12½	@	2.25
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	1.90	@	2.00
Domestic	1.75	@	1.80
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	1.90	@	2.00
Domestic	1.60	@	1.75
Scrap Sisal	1.90	@	2.00
Scrap Sisal for Shredding	2.10	@	2.25
Wool Tares, heavy	1.90	@	2.00
New Burlap Cuttings	2.00	@	2.25
Australian Wool Pouches	2.35	@	2.50
Heavy Baling Bagging	1.85	@	2.20
Paper Mill Bagging	1.65	@	1.70
Bagging No. 2	1.10	@	1.25

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.07	@	.07½
New White No. 2	.04	@	.04¼
Silesias No. 1	.05	@	.05½
New Black Silesias	.03½	@	.04¼
Soft Unbleached	.07¼	@	.07¾
Blue Cheviot	5.50	@	6.00
Fancy	.02½	@	.02¾
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.50	@	6.00
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.03¾	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.35	@	1.50
No. 2	1.20	@	1.25
No. 3	—	@	1.15

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.70	@	2.00
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.75	@	1.90
Old Linsey Garments	2.12½	@	2.37½
New Silesias	5.00	@	5.75

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	4.80	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	40.50	@	—
Sheets	45.00	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	.90
Light and Crumpled Book Stock	.70	@	.80
Ledgers and Writings	.90	@	1.00
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.35	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.07½	@	.07¾
Fancy Shirt Cuttings	.02¾	@	.03